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Covid-19 in the Arctic

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Covid-19 in the Arctic:

Briefing Document for Senior Arctic Officials¹

Senior Arctic Officials' executive meeting
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Acronyms and Abbreviations

AAC	Arctic Athabaskan Council (Arctic Council Permanent Participant)
ACAP	Arctic Contaminants Action Program (Arctic Council Working Group)
AEST	Alaska Economic Stabilization Team
AHHEG	Arctic Human Health Expert Group (SDWG Expert Group)
AIA	Aleut International Association (Arctic Council Permanent Participant)
AIDS	Acquired immunodeficiency syndrome
AIP	Arctic Investigations Program within the United States Centers for Disease Control and Prevention
AMAP	Arctic Monitoring and Assessment Programme (Arctic Council Working Group)
ANTHC	Alaska Native Tribal Health Consortium
AOS	Arctic Observing Summit (biennial science conference)
ARENA	Arctic Remote Energy Networks Academy (SDWG project)
ASNA	Arctic Slope Native Association
ASSW	Arctic Science Summit Week (annual science conference)
BIN	Business Index North
CAFF	Conservation of Arctic Flora and Fauna (Arctic Council Working Group)
CARES	Coronavirus Aid, Relief, and Economic Security Act (US)
CDC	United States Center for Disease Control and Prevention
CERB	Canadian Emergency Response Benefit
CLINF	Nordforsk Centre of Excellence
Covid-19	Coronavirus disease (Covid-19) is an infectious disease caused by a newly discovered coronavirus. (WHO definition)
EGBCM	Expert Group on Black Carbon and Methane (Arctic Council)
EPPR	Emergency Prevention, Preparedness and Response (Arctic Council Working Group)
FAO	Food and Agriculture Organization of the United Nations

FiFo	Fly-in/Fly-out
GCI	Gwich'in Council International (Arctic Council Permanent Participant)
GDP	Gross Domestic Product
GNWT	Government of the Northwest Territories
H1N1	Influenza A (H1N1), also known as swine flu
HHAG	Human Health Assessment Group (AMAP Expert Group)
HHS	U.S. Department of Health and Human Services
HIV	Human immunodeficiency viruses
HSS	Health and Social Services (Canada)
IASC	International Arctic Science Committee
IASSA	International Arctic Social Sciences Association
ICC	Inuit Circumpolar Council (Arctic Council Permanent Participant)
ICS	International Circumpolar Surveillance
ICSF	Indigenous Community Support Fund (Canada)
ICU	Intensive Care Unit
INTERACT	International Network for Terrestrial Research and Monitoring in the Arctic
ITK	Inuit Tapiriit Kanatami (Canadian organization representing over 60,000 Inuit)
LEO	Local Environmental Observer Network
MHTTC	Mental Health Technology Transfer Center (US)
MOSAic	Multidisciplinary drifting Observatory for the Study of Arctic Climate
NIHB	National Indian Health Board (US)
NSF	National Science Foundation (US)
NWT	Northwest Territories
PPE	Personal protective equipment
RAIPON	Russian Association of Indigenous Peoples of the North (Arctic Council Permanent Participant)
RDA	Research Data Alliance

SAO	Senior Arctic Official
SAON	Sustaining Arctic Observing Networks
SARS-CoV-19	Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the strain of coronavirus that causes coronavirus disease 2019 (COVID-19).
SDWG	Sustainable Development Working Group (Arctic Council Working Group)
SECEG	Social, Economic, Cultural Expert Group (SDWG Expert Group)
TKLK	Traditional knowledge and local knowledge
THL	Finnish Institute for Health and Welfare
UArctic	University of the Arctic
WHO	World Health Organization
YKHC	Yukon-Kuskokwim Health Corporation

Briefing document for Senior Arctic Officials: Overview of the coronavirus pandemic in the circumpolar Arctic

Introduction

In March 2020, the World Health Organization (WHO) declared the outbreak of the novel coronavirus disease a pandemic, **bringing drastic changes to people's lives overnight**. Since then, Covid-19 has reminded the world of how **vulnerable societies can be in the face of infectious diseases**. The pandemic not only represents great **risk to human health**, it creates **challenges for social, economic and cultural systems**, despite the rapidly advancing global effort to develop countermeasures.

As the coronavirus continues to spread across the globe, **it has become evident that the pandemic and measures taken to prevent its spread** would be poised to have **significant effects on public health and societies**. The Arctic region, especially rural and remote communities, faces **unique risks and challenges** as a result of both the pandemic and the actions taken to respond to it. Covid-19 **underscores existing vulnerabilities** of Arctic communities and may produce new challenges. Arctic communities have unique health and social needs and face distinctive circumstances. They also have longstanding physical and social infrastructure deficits and fragile and/or resource-dependent economies. On the other hand, the current circumstances also demonstrate the strengths and resilience of Arctic peoples. The global health crisis represents an opportunity to better understand and support the resilience of Arctic communities.

Purpose

The Arctic Council is well-positioned to play a leadership role in better understanding the impact of Covid-19 in the Arctic and spearheading activities to respond to the pandemic in the short-, medium- and longer-term.

This briefing document was prepared to inform initial discussions regarding the coronavirus pandemic in the Arctic at the Senior Arctic Officials' executive meeting (SAOX) on 24-25 June 2020. It draws together available information – to date (June 2020) – about the impact of

Covid-19 and the actions taken to respond in the Arctic region. The document draws from a wide spectrum of sources, reflecting the complex and intricate nature of how Covid-19 affects Arctic peoples and communities, including national and subnational statistical databases and tools, peer-reviewed articles, policy statements, technical guidelines, field surveys, and local observations from Arctic communities. This document was produced using **available material and data** provided by **reliable sources** (see key resources that informed each section in [appendix 1](#)); however, given the short timeframe available to produce the document and the rapidly evolving situation, gaps in information remain and should be further examined moving forward.

Process

The preparation of this briefing document relied on existing Arctic Council networks and was open and collaborative. It involved contributions and input from more than fifty researchers affiliated to the Council's Working Groups, policy makers, Indigenous representatives and Indigenous knowledge holders from all Arctic States and Permanent Participants. This group provided source material and helped shape the themes and issues that would be covered. The document itself was authored by 17 experts that represent all Arctic States. This work was also supported by a coordinating team, which included the Chairs of the Arctic Human Health Expert Group (AHHEG) and the Social, Economic and Cultural Expert Group (SECEG), the Executive Secretary of the Sustainable Development Working Group (SDWG), and an Advisor and the Head of Communications from the Arctic Council Secretariat. The process of preparing this briefing document provides a powerful example of the strength and capacity of the networks of experts and knowledge holders associated with the Arctic Council and their commitment to the Arctic Council's work on Covid-19 in the Arctic. For more details about the process used to prepare this briefing document, please see [appendix 2](#).

Document Outline

Part I of the briefing document looks at **existing public health actions and activities** across the circumpolar Arctic, while **Part II** focuses on **consequences of the pandemic and public health responses**. In **Part III**, core themes from Parts I and II are highlighted and mapped in relation to their contributions to the resilience or vulnerabilities of Arctic communities. In addition, ideas are explored about the role of the Arctic Council that are intended to inform a discussion about **potential work that the Arctic Council is best positioned to undertake in relation to Covid-19 in the Arctic**. Finally, appendices have been included to provide 1) an overview of key resources

that informed each thematic section, 2) a more detailed description of the process used to prepare the briefing document, 3) a presentation of the interview questions provided to Permanent Participants and an overview of the individuals and organizations that responded.

Before getting into specific impacts of the coronavirus pandemic in the Arctic, **a brief historical overview describing past epidemic infectious diseases in the Arctic and lessons-learned from those experiences are presented below as a contextual backgrounder** to the briefing document and its observations.

Historical Context: Influenza and other epidemic infectious diseases in the Arctic

Pandemics have repeatedly struck the Arctic dating back to medieval times when the Plague reached the northern hemisphere. Smallpox was a great killer, cholera was introduced, tuberculosis was and still is a devastating disease and various influenza pandemics have raged in the Arctic, the worst of which was the 1918 pandemic. Measles, mumps, polio, HIV/AIDS and the H1N1 pandemic in 2009 have all struck the Arctic before the occurrence of the coronavirus pandemic. **The experiences of previous pandemics offer important lessons for today.**

Remoteness and immunity

Being part of a small, remote and isolated community presented clear risks in the Arctic during the 1918 influenza pandemic, often referred to as the Spanish Flu. In Alaska, there were **communities where the entire population died**. The remote location of Arctic communities often means that the successive immunization that usually takes place in populous towns does not happen. Remote populations are particularly susceptible when the virus reaches them, as witnessed by many Indigenous peoples in Latin America during the smallpox and measles epidemics in the 16th century when the disease was introduced by the conquistadors.

The result is often devastating. Moreover, it is not unusual that the **later waves of a pandemic are often more aggressive**. For example, the 1918 influenza pandemic reached Arjeplog Municipality in Northern Sweden as late as 1920, but the result was that the parish had the overall highest flu mortality in the whole of Sweden. Further, elderly Arctic people had lower immunity during the 1918 influenza pandemic due to limited exposure to similar viruses 1890-1917. On the other hand, depending on the epidemiology of the disease, remote communities can also be spared due to being disconnected and never experience the virus.

Epidemiologic transition

Biological and social contexts interact to influence the impact of pandemics. The mortality pattern has changed significantly over the past 500 years, and Western development has gone from rampant infectious diseases to more man-made causes of death such as cancer and cardiovascular diseases. Life expectancy has increased, and our knowledge has improved. The Arctic, especially the Indigenous peoples, have a double burden in that a great part of the region remains in a pre-transition state of the epidemiologic transition. They suffer from a **higher risk for pandemic influenza due to chronic underlying health conditions, infectious diseases such as tuberculosis, inadequate access to health care, delayed seeking of care and a chronic lack of basic infrastructure**. The people in the Arctic, however, also suffer from the more modern Western causes of death.

Epidemic pathways

It is much easier for a virus to spread in the present-day, even to remote places. There were three main ways the 1918 influenza spread: among military that lived in close proximity and traveled all over the world, among migrant workers constructing railway systems, working in the forest industry and in mining, and with passengers arriving from long distances with ships.

Indigenous peoples

Indigenous peoples of the Arctic have almost always had **higher pandemic mortality**. Smallpox, measles, tuberculosis and the 1918 influenza were all more devastating in Indigenous communities. Many present-day communities have excess mortality rates from a number of infectious diseases, such as pneumonia, influenza, tuberculosis, chronic otitis media, respiratory tract infections, hepatitis B virus infection, sexually transmitted diseases, *Helicobacter pylori* infection, parasitic infections and bacterial zoonosis. Indigenous peoples in North America suffered disproportionately from the H1N1 influenza pandemic in 2009. However, **Indigenous knowledge has been useful throughout history to allow for flexible and adaptive responses to pandemics and strengthened resilience**. For example, the Saami in Scandinavia managed to evade smallpox infections due to a correct understanding of the spread of the disease and pragmatic action.

Health care organization

Many Arctic communities experienced **underdeveloped medical health care systems and infrastructure**. As a result of the 1918 influenza pandemic, more medical professionals were recruited to rural areas, and health care stations were established.

Local authorities and the state

The local and state authorities and governments have responded differently during pandemics across the Arctic. The devastating tuberculosis outbreak forced states to act in the early 1900s with varying degrees of success. They allocated funding for nursing homes and gave grants to doctors to improve competence in diagnosis and treatment and building sanatoria. The interplay between local, regional and central authorities has been important.

Communication and information

During the 1918 influenza pandemic, the information communicated to the public was limited. Newspapers wrote surprisingly little about the 1918 pandemic and many did not have access to newspapers, and this was before the radio era.

Equality

The medical health care and social systems in the rural North had been marginalized for a long time when the 1918 influenza appeared. There was a lack of nursing homes, hospitals, trained medical personnel and equipment. **Vulnerable groups such as the elderly and poor have often been disadvantaged.**

Vaccination

Vaccination was the key element when smallpox was globally eradicated and is today an important weapon against many infectious diseases. It was often difficult to perform vaccinations in the vast Arctic regions with limited number of doctors and vaccinators. Law enforcement of smallpox vaccination differed between the Arctic countries, as did mortality. Arctic countries were slower to implement vaccinations in their northern parts.

Community-based pandemic planning

The experiences of previous pandemic planning show that **communities, especially Indigenous ones, have been neglected in pandemic planning**. Their unique living conditions and

experiences are important and collaborative planning leads to increased acceptability, feasibility and implementation of pandemic plans.

Population data and projection

Mortality, and to some extent morbidity, of epidemic infectious diseases have been documented in official registers since the 18th century. Knowledge about the numbers of infected and deceased are crucial for a correct understanding of the outbreaks. This is also true today. Inconsistent and incompatible data has always been a challenge, and there is a need to develop relevant indicators. Moreover, population projections are important for a correct understanding of the demographic future of the Arctic. Using the definition of the Arctic region given in the Arctic Human Development Report II (2015, <https://www.sdwg.org/wp-content/uploads/2016/04/AHDRIIFINALREPORT2015-02-24.pdf>), the Arctic has four million inhabitants, and that will not change significantly in the near future. However, different areas of the Arctic will diverge due to substantial population growth in Alaska, Yukon, Nunavut, Iceland, Troms, Khanty-Mansi Autonomous Okrug and Chukotka, while Kainuu, Northern Karelia, Lapland, Komi, Arkhangelsk, Murmansk and Magadan can expect a population decline. This has a strong impact on future pandemics.

Lessons learned from past pandemics in the Arctic

- Arctic inhabitants experienced devastating effects from the 1918 influenza pandemic. **Remote communities had the lowest immunity and were worst struck.**
- People in the Arctic are vulnerable to pandemics due to **complex high-level mortality** owed to chronic underlying health conditions, infectious diseases such as tuberculosis, inadequate access to health care, and severe infrastructure deficits.
- In the past, there were fewer ways for an infectious disease to spread globally as **societies were not as interconnected** as today. Today we know that one mitigation strategy is to **avoid gatherings of many people.**
- Indigenous peoples in isolated communities have a high risk of infectious pandemic mortality, but **traditional knowledge has contributed to prevention.**
- It is very important to have **sufficient, skilled medical personnel, equipment** and **localities** for treatment of infectious diseases.

- It is important that the **situation is actively managed by regional authorities**, including health care and social care for children, elderly and others. The state has an important overall responsibility.
- It is important to **provide and disseminate information**, advice and legislation from experts and authorities and listen and receive information from communities.
- There is a need for **equal access to health care and social systems in the Arctic** to protect especially the most vulnerable from Covid-19.
- It is important to give Arctic residents **equal access to vaccination** and to develop strategies for supply and delivery.
- It is imperative to **engage citizens in pandemic planning**.
- Population registers should be improved to **gain demographic knowledge** that is necessary for pandemic planning.

PART I: Existing Public Health Actions and Activities Across the Circumpolar Arctic

Part I of this briefing document addresses existing public health actions and activities across the Arctic. It includes an overview of available Covid-19 epidemiological data for the Arctic region. Furthermore, it contains a review on infectious disease monitoring and assessment and an outline of the urgency to harmonize data in the Arctic. Other sections discuss patient care and public health information sharing, awareness and education. The final section addresses Covid-19 risk management and mitigation in the Arctic.

1.1 Available epidemiological data

To date, most Arctic jurisdictions have experienced cases of Covid-19. As with other regions, there is available information on local, national and international Covid-19 cases. However, obtaining **relevant information for the Arctic is hampered by the remoteness of the different Arctic areas**. While Iceland is an Arctic State in itself, some other Arctic regions are part of larger jurisdictions, for whom data on national levels are limited. For these regions, specific information needs to be obtained on sub-national levels, if such sources exist. However, **this is not readily available for all areas in public statistics**.

In addition, cities, towns and settlements in the Arctic are of highly variable living conditions and sizes spanning from, for example, the municipality of Anchorage, Alaska, with a population of around 290,000 people to settlements with less than 100 inhabitants, such as in Greenland, Nunavut and Iceland. Also, despite variations in the size of settlements in the Arctic, the number of small, remote communities is much higher relative to settlements in the southern jurisdictions of Arctic States. As the burden of Covid-19 may be quite different in a city compared with **small settlements, nationwide or statewide statistics may not sufficiently reflect the relative disease burden in the Arctic**.

Incidence rates and case-fatality rates of Covid-19 are currently lower in Arctic areas than in the more southern regions of the respective countries. There are no clear explanations for this. One contributing factor may be focused and timely efforts by the local authorities with, for example, the introduction of travel restrictions and pre-travel testing, as in the case of Nunavut and Greenland. However, **Arctic communities may be severely hit by the introduction or more widespread local transmission of Covid-19 as a result of the unique conditions in the region**.

For example, housing conditions in many parts of the Arctic favor transmission of the virus and limited health systems may be overburdened, even with just a few cases.

Worldwide Covid-19 updates can be followed on the daily-updated Johns Hopkins University Covid-19 dashboard [<https://coronavirus.jhu.edu/map.html>]. A similar regularly updated website exists for Arctic regions ('Covid-19 confirmed cases in the Arctic') managed by the ARCTICenter at the University of Northern Iowa in the United States [<https://univnortherniowa.maps.arcgis.com/apps/opsdashboard/index.html#/b790e8f4d97d4414b10c03d5139ea5d5>]. This page is based, among other sources, on the global Corona Data Scraper website [<https://coronadatascraper.com/#home>] that pulls Covid-19 cases from verified sources on national and local levels. In this dashboard, the countries differ in the levels of reporting, e.g. with figures from all of Alaska are available, but only some of the Arctic jurisdictions of Canada. Information from Nunavik in Canada is amalgamated with Quebec provincial data and is thus inaccessible. Unlike the Johns Hopkins worldwide dashboard, there are only absolute figures on cases and deaths and a cumulative graph of cases for the whole region, while the former contains information of different rates that facilitate comparisons with other areas.

Based on the Corona Data Scraper website that, unlike the University of Northern Iowa ARCTICenter dashboard, contains population figures, the present figures (up to 14 June, 2020) for the Arctic region are seen in **Table 1**. This website does not contain all cases from the Arctic compared with the University of Northern Iowa ARCTICenter dashboard, but it allows for comparison of regional Arctic and nationwide rates. Figures from the Corona Data Scraper website may deviate from the more precise figures given by local authorities as shown in Table 2.

Table 1. Covid-19 cases in Arctic regions. Figures from the Corona Data Scraper

[<https://univnortherniowa.maps.arcgis.com/apps/opsdashboard/index.html#/b790e8f4d97d4414b10c03d5139ea5d5> and <https://coronadatascraper.com/#home>] accessed June 14, 2020. Population sizes of Arctic areas of Sweden and Norway from Statistics Sweden and Statistics Norway.

Region / country	Population	COVID-19 cases	COVID-19 deaths	Incidence / 100,000 ⁶	Mortality rate/100,000
Canada (Arctic)	121,630	16	0	13.2	0
Canada (national)	36,708,083	98,399	8,107	268.1	22.1
Finland (Arctic)	(not given)	443	0		
Finland (national)	5,516,224	7,087	325	128.5	5.9
Greenland (national)	56,081	13	0	23.2	0
Iceland (national)	364,260	1,808	10	496.3	2.7
Norway (Arctic)	484,546	374	3	77.2	0.6
Norway (national)	5,367,580	8,628	242	160.7	4.5
Russia (Arctic)	(not given)	29,478	196		
Russia (national)	147,500,000	519,458	6,819	352.2	4.6
Sweden (Arctic)	521,829	1,176	(not given)	225.4	
Sweden (national)	10,327,589	50,931	4,866	493.2	47.1
US (Alaska)	731,545	654	12	89.4	1.6
US (national)	325,145,963	2,063,249	109,249	634.6	33.6

The table shows that incidence rates (cases of Covid-19 per capita) as well as mortality rates are lower in Arctic regions than the total national rates of the countries the Arctic regions are parts of. Yet, there are marked differences in rates between the Arctic regions.

Table 2 shows specific figures for individual Arctic regions and countries from local authorities and sources as informed from members of the Arctic Monitoring and Assessment Programme's (AMAP) Human Health Assessment Expert Group.

Table 2. Covid-19 cases in some Arctic areas as informed by local authorities through the Arctic Council's AMAP Human Health Assessment expert group (AHHEG) members by or through national data sources between June 7 and June 14, 2020.

Region/ Country	Cases	Recovered	Hospitalizations	Deaths
Alaska, US	654	405	52	12
Yukon, NWT, Nunavut, Labrador, Canada	22	22		0
Nunavik, Canada	16			
Faroe Islands	187	187	20 (app.)	0
Greenland	13	13	0	0
Iceland	1,807	1,794	120	10
Lapland, Finland	218			6

It is unclear how accurately these figures reflect the circumpolar Covid-19 situation. Thus, the number of notified cases clearly depends on referral to testing, local testing capacity and availability, reporting of test results to central authorities, case definitions and more. For example, in Greenland during the beginning of the pandemic, SARS-CoV-19 throat swabs were sent to Denmark for testing, but are now tested in its capital, Nuuk. Still, samples from elsewhere in Greenland need to be sent to Nuuk and are therefore dependent upon air transport. Similar limitations in the collection of samples and testing capacities must be expected to apply to other Arctic areas.

Knowledge gaps and areas for potential action

- Establish a better **understanding of the unique conditions and characteristics of Arctic jurisdictions that may contribute to incidence and case-fatality rates.**
- Ensure that policy planning, development and implementation considers the **distinctive impacts of the coronavirus pandemic in Arctic jurisdictions relative to what is observed at the national level by Arctic States.**
- Follow the pandemic specifically in Arctic areas and **ensure that data on Covid-19 is organized and easily accessible at a circumpolar level.**
- Further **develop websites and dashboards** with underlying population figures and other data, similar to the work done by the University of Northern Iowa ARCTICenter dashboard.

¹Johns Hopkins University & Medicine. (2020). COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU). *Coronavirus Resource Center*. See: <https://coronavirus.jhu.edu/map.html>

²University of Northern Iowa (2020). Covid19 confirmed cases in the Arctic. Arctic Center. See: <https://univnortherniowa.maps.arcgis.com/apps/opsdashboard/index.html#/b790e8f4d97d4414b10c03d5139ea5d5>

³Davis, L. (2020). Corona Data Scraper. See: <https://coronadatascraper.com/#home>

⁴Covid-19 cases by 100.000

⁵Percentage of deaths by infected persons

⁶Kainuu, Keski-Pohjanmaa, Lansi-Pohja, Lapland, Pohjois-Pohjanmaa

1.2 Infectious disease monitoring and assessment

With the current pandemic, there is a particularly **urgent need to harmonize data**, including analysis methods and the number of cases, recoveries, hospitalizations and deaths. Arctic regions face many of the same conditions and challenges regarding Covid-19, thus enhancing circumpolar and transnational collaboration, surveillance and harmonization of case definitions are **important to control the pandemic in the Arctic**.

Infectious disease rates across the Arctic are highly variable, depending on country, disease, age, sex and location. Improved sanitation, medical treatment, vaccinations and education have reduced infectious disease rates and health disparities, yet **Indigenous populations suffer higher rates of infections compared to non-Indigenous populations across the Arctic**. All Arctic countries have their own guidelines, regulations and practices to monitor and collect data of infectious diseases.

There are also a number of **Arctic collaborative programs**, such as long-standing monitoring programs in Barents Euro-Arctic cooperation (e.g. tuberculosis, HIV/AIDS) between Norway, Finland, Sweden and the Russian Federation, and many countries participate in World Health Organization (WHO) programs on infectious diseases. There are also monitoring networks, such as the Local Environmental Observer Network (LEO) led by the Alaska Native Tribal Health Consortium. The LEO network enables local Arctic inhabitants and topic experts to inform and share information about unusual and unprecedented environmental events (e.g. new diseases

and species). The Arctic Council's Arctic Contaminants Action Program (ACAP) helped expand this network to become circumpolar.

The International Circumpolar Surveillance System's (ICS, since 1999) monitoring program focuses on a number of important infections in the Arctic populations. While it mainly focuses on invasive bacterial infections, it also includes other infections such as viral hepatitis, tuberculosis, sexually transmitted infections and *Helicobacteri pylori* infection. ICS is affiliated with the International Union of Circumpolar Health (IUCH), an Observer to the Arctic Council.

ICS has collected information from all Arctic regions. During the last decade, there has been increasing focus on **emerging and climate-sensitive infections in the Arctic**. There are other networks and research projects focusing on zoonotic diseases, such as climate change effects on the epidemiology of infectious diseases and the impacts on Northern societies (CLINF: <https://clinf.org/>) and the International Network for Terrestrial Research and Monitoring in the Arctic (INTERACT: <https://eu-interact.org/>) subproject. According to recent reviews and publications, differences in monitoring practices of infectious diseases exist.

Infections, such as tick-borne diseases (e.g. encephalitis and borreliosis), tularemia, anthrax and vibriosis, midge-borne bluetongue and parasitic infection fasciolosis, are good candidates to be climate-sensitive infectious diseases that could be relevant for humans and animals living in Northern regions^{1,2}. One concern of **climate warming and permafrost thaw** is that there might be a **release of infective agents**, especially anthrax from older burial places, that have been buried for a long time in frozen ground³. This joint approach of human and wildlife health is called One Health, which is the focus of an Arctic Council Sustainable Development Working Group (SDWG) project that has brought together experts to strengthen regional knowledge sharing and coordination across Arctic since 2015 (One Arctic, One Health, <https://arctic-council.org/en/about/working-groups/sdwg/>). The One Health concept is also discussed in the Arctic Monitoring and Assessment Program (AMAP) scientific report on human health to be release in 2021. To follow the developmental rates of the infectious diseases in a time with marked climate change, a **systematic surveillance program of these infections in the northern regions needs to be established**.

Currently, there are big differences in monitoring infectious diseases in the Arctic, including in nine potentially climate sensitive zoonotic diseases in the five Nordic countries⁴. A report of the registered data collected from health authorities showed incompatible reporting systems and

differences in regulations. Therefore, **international standardization in surveillance and case notification is warranted.**

Significant differences in the registration of epidemic data are not limited to climate-sensitive infections but apply to a number of infections. Therefore, **there is an urgent need for harmonization.** The large data variability limits the possibilities to conduct multi-country studies. There is also a need to **establish a joint list of reportable diseases** by using the same reporting method to improve international surveillance and actions.

Arctic State actions during Covid-19

- The coronavirus pandemic has **strengthened the already existing northern networks** in the Euro-Arctic region, including between the neighboring countries of Finland, Sweden and Norway, whose health care authorities have moved from monthly to weekly meetings. **Digital tools have been developed**, and follow-up information and data on infection, medical care staff and other **resources have moved into an electronic format** so the regional authorities can easily share and have access to the most up-to-date daily information to inform decisions and actions.
- In rural areas and small communities, it is difficult to collect data and share information because of the lack of access to internet and connectivity. **Text messages and phone calls are used to collect information** about the most sensitive population groups, like the young and elderly.
- Governments have **increased funding to support healthcare capacity** connected to Covid-19, including for monitoring, testing, diagnosing, and health care providers.
- Arctic States have **established public information channels and websites** focused on the virus infection. Arctic States are regularly updating these channels with the numbers of infection cases, deaths and intensive care.
- **Monitoring is happening on a circumpolar level**, and is usually available at the regional level.
- Challenges have been, among others, **changing criteria** on who is eligible for testing over the course of the pandemic, testing capacity and developing strategies and scenarios based on epidemiological models, especially in small populations.

Knowledge gaps and areas for potential action

- **Harmonize data**, including analysis methods and the number of cases, recoveries, hospitalizations and deaths.
- **Ensure local surveillance of the virus to support control of the pandemic.** Measures include access to testing and central registration of results.
- **Allow syndromic surveillance** (surveillance of patients with symptoms compatible with Covid-19) **to improve overall observation and understanding** of the disease.
- **Make information available in a central location**, such as a website that includes information on Arctic testing capacities and availability, case definitions, actions taken, experiences and best practices to help public health systems throughout the Arctic control the pandemic.
- **Improve coordination and synergies** in the governance of experts working in this area.

¹ Waits A, et al. Human infectious diseases and the changing climate in the Arctic. *Environment International* 121, 703–713, 2018.

² Omazic T, et al. *Identifying climate-sensitive infectious diseases in animals and humans in Northern regions. Acta Veterinaria Scandinavica* 61 53, 2019.

³ Hueffer K, et al. Factors contributing to Anthrax outbreaks in the circumpolar North. *EcoHealth*. 17, 174-180, 2020. <https://link.springer.com/article/10.1007/s10393-020-01474-z>

⁴ Omazic T, et al. *Discrepancies in data reporting of zoonotic infectious diseases across the Nordic countries – A call for action in the era of climate change. International J Circumpolar Health*. 78:1, 1601991, 2019.

1.3 Patient care

Patients infected by the coronavirus can develop very different physical symptoms, which can range from mild flu-like to serious lung infections. Therefore, patients' conditions can quickly change and deteriorate, from low-risk to very high-risk. When dealing with a contagious disease-causing pandemic like Covid-19, it is important to isolate the infected from the uninfected. Furthermore, patients are encouraged - and in some cases mandated - to stay at home both to reduce the risk of spread and to not fill scarce hospital and intensive care unit (ICU) beds. Hospital capacity must be saved for the seriously ill, who need high-intensity technological medical support and skilled ventilator care. In an Arctic context, where **long**

distances to health care are common, this causes a significant problem that **can lead to serious complications or death** because of delays or lack of transportation services to health facilities.

In many Arctic communities, **access to acute medical and nursing care is insufficient**. The health care systems depend on non-residents and health care professionals traveling in and out from other regions to provide services, **which creates a high transmission risk**. Further, relying on the transportation of very contagious Covid-19 patients to acute health care facilities not only increases the risk of transmission, but it is also very expensive. Policies are needed in the Arctic to address shortages of trained health care professionals and workers, and appropriately subsidize emergency travel within the Arctic, including across borders (see [section 2.6 on mobility](#)).

Fortunately, the incidence of infection in the Arctic remains low compared to national statistics. However, this does not reduce the **importance of planning transportation logistics** in remote Arctic areas before they are needed. Access to acute medical and nursing care for those in remote places often includes air travel. For example, in Greenland, serious medical cases are flown to Copenhagen, Denmark, and cases in remote areas of Iceland are flown to either Reykjavik or Akureyri. In Alaska, Canada and the Russian Federation, large hub towns have a hospital or health clinic – a first place that people could go for medical health issues of concern.

The common methodology to provide acute care to the seriously ill in remote Arctic communities is to **fly the patients to hospitals in more populated areas**. The local hospitals need to prepare and plan for a wave of Covid-19-related illness from all corners of the community. **Limited number of respirators, ICU-space and isolation rooms make the community more vulnerable during the coronavirus pandemic**.

In some places in the Arctic, **telehealth**, including telemedicine and its underlying telecommunications technology tools, has shown to be helpful to support traditional health care during the pandemic. For example, in a remote Icelandic community it was impossible for an ambulance flight to land and transport a patient to an urban health care center due to extremely bad weather. The health care workers had to rely on communication via telehealth to take care of the Covid-19 patient. However, **telehealth procedures and virtual care in the Arctic requires connectivity and appropriate technologies** (see [section 2.7 on infrastructure](#)), as well as capacity to use it.

Another health implication is the **cancellation and postponement of planned health checks and preventive visits**. Delaying non-emergency operations as a result of Covid-19 is likely to negatively affect overall health and wellbeing of the Arctic peoples in many northern parts of the Arctic States, where there are already high mortality rates due to ischemic heart disease, cancer, chronic respiratory diseases and suicides (see section [2.1 on impacts on physical well-being and mental health](#)).

Furthermore, concerns are rising about the virus and the measures taken against it, fearing they could cause **long-term mental health issues**. In the Arctic, where concerns about mental health and suicide are long-standing challenges, there is a particular need to reflect on the consequences. Fostering mental well-being must be an important component of a holistic approach to address the longer-term effects of the coronavirus outbreak. **The Arctic Council's Sustainable Development Working Group (SDWG) project Local2Global** (<https://www.sdwg.org/local-2-global/>) is one of these efforts.

Human resources in health care

Shortages of human resources in health care is a challenge in “normal” times. During a pandemic, this challenge can quickly turn into an extremely problematic situation. For example, in Bolungarvik in the Westfjords of Iceland, all the nurses working at a nursing home became infected with Covid-19. It was a traumatic experience for the small town, and some nurses who were infected while working dealt with self-shame and self-inflicted stigma because they felt they had failed in their work. Crisis situations generated by the coronavirus pandemic affect human resources in health care on top of existing strains on medical capacity described.

Support must be provided to health care professionals exposed to the traumatic impacts of Covid-19 and authorities must ensure sustainable health capacities for their health personnel in the future (see [section 2.1 on impacts on physical well-being and mental health](#)).

Remote Arctic areas already face shortages of registered nurses and doctors. The coronavirus pandemic has required healthcare workers and training personnel to be reassigned to carry out tasks they do not normally do. This requires, for example, extra training for experienced registered nurses to work in intensive care. There have also been national calls to retired registered nurses, health care professionals and those who have left clinical health care to volunteer during the pandemic.

Health care infrastructure

Remote Arctic communities suffer from infrastructure deficits. Not everybody in these communities has access to health care and acute health services. This is the result of a **lack of funding to support effective and comprehensive training for health personnel** – not just in the face of the pandemic, but also for general health in Arctic communities. Small, remote communities continue to face a host of infrastructure gaps, including **overcrowded housing**. For example, how does one enter quarantine when living in a single household with eight or more people? (See [section 2.7 on infrastructure](#)). Furthermore, during the coronavirus pandemic, it is important to be **aware and practice culturally-appropriate care**. One example to consider is **funeral care**, including cleaning and preparing bodies, which is often dependent on family or community members.

Equipment

There is not only a deficit in terms of human resources, but also of hardware, such as Personal Protective Equipment (PPE) kits. Equipment is a key element to containing the virus at the community level.

There has been sufficient Covid-19 testing material in larger Arctic communities and support by southern regions to Arctic communities. However, in many of those communities there has been a scarcity of testing materials and long waiting times to receive supplies. In the beginning of the coronavirus pandemic, scarcity of testing pins influenced the spread of the virus in some areas.

Knowledge gaps and areas for potential action

- Conduct research on why some people get mild symptoms and others get seriously ill from Covid-19, with a specific focus on **why the presentation of Covid-19 symptoms are different in Arctic populations**.
- Assess **how well telehealth supported access to health care in the Arctic during the coronavirus pandemic**.
- **Learn from the experiences of health care providers** in the Arctic during Covid-19 crisis and see **how to enhance support** provided to these workers in the post-pandemic period.

- Examine **how the shortage of ICU ventilators was handled in different areas of the Arctic.**
- **Map, analyze and strengthen** the health care and emergency capacity in the Arctic.

1.4 Public health information sharing, awareness and education

Throughout the coronavirus pandemic, public health information, often shared via statements from chief public health officers and other top officials, is linked to government websites. These websites also link to the websites of other regional governments and Indigenous bodies, such as the Saami Parliament in the Finnish context, Norton Sound in the Alaskan context and Vuntut Gwitch'in First Nation in the Canadian context. Flexible methods of **communication via radio, state broadcasted TV channels, press releases and social media are all noted as valuable in isolated and Indigenous communities.** In particular, local radio channels are vital in the Alaskan and Canadian contexts as they translate and disseminate Covid-19 updates into local Indigenous dialects, so they are accessible to all community members, including Elders and those without Wi-Fi connections or computers. The **use of near-instant methods of communication** throughout the coronavirus pandemic, including through Indigenous organizations' and government-managed social media accounts and Facebook live events with politicians and local leaders, have been **central in conveying quickly changing information directly to the public.** For example, in Alaska, up-to-date information is given on mobile testing centers, and questions and concerns from community members related to Covid-19 spread within communities are answered.

Official Covid-19 guidelines and information on travel restrictions are released on existing government websites, generally in the format of press releases, audio recordings for the visually impaired and official statements. Some countries, such as Finland, responded by creating a centralized Covid-19 communications website. Covid-19 guidelines are also available through fact sheets, interactive infographics, flyers and online pamphlets for **easy community dissemination.** Finland has made Covid-19 recommendations and updates available in Saami languages while Canada's northern territories have done similarly for First Nation and Inuit languages. Iceland has made Covid-19 information available in nine languages.

Leadership in the American context has also **addressed misinformation** concerning Covid-19 through frequently asked questions information sheets and press releases. The Canadian

government has also responded to news sources that claim that narwhals and whales could carry Covid-19 and infect Northerners through consumption. The government released clear statements that wildlife contamination is incredibly unlikely, and the Canadian national Inuit organization, Inuit Tapiriit Kanatami (ITK), has also released infographics on how to safely prepare country foods and assures Northerners that marine mammals and other country foods remain healthy food choices.

Translation into local context

State recommendations are **translated through a cultural lens to the local realities of northern communities by regional and Indigenous organizations**. As information is communicated to the public in specific areas, the complexity of the language used is adjusted and local examples are used to make it relevant and accessible to all community members. For example, regional and Indigenous organizations offer infographics in simplified English for suggestions on how to sanitize homes in the absence of running water and how to social distance while hunting. This information is available online in printer-friendly formats such as pamphlets and information sheets for dissemination in communities that may not have sufficient internet access. Many online resources also offer **culturally appropriate suggestions on maintaining social contact** during Covid-19. For example, Icelandic government websites suggest alternatives to handshakes, and Indigenous organizations suggest video calling Elders to maintain contact.

Perception and response

Public health recommendations are often written to suggest that keeping communities safe from Covid-19 is the responsibility of individual community members, which can be achieved by voluntarily abiding by public health recommendations. Messages like ‘do your part’, and ‘we all have a responsibility to keep each other safe’ are commonly seen on public health websites and social media resources. Various circumpolar partners have stressed the importance of having **accurate and consistent messaging from community and state leaders concerning Covid-19 transmission**, as trust in leadership is noted as a key ingredient to ensure individuals abide by public health recommendations. Using pre-Covid-19 channels of communication was noted as effective when possible to reduce the time it takes to create new methods of communication and encourage public uptake. Examples of this include increasing community call-ins with tribal leaders to daily phone calls available to all community members.

The role of Elders in their communities also has an effect on how communities perceive Covid-19. As keepers of historical memories, they pass on the lessons learned during past contagions, such as the 1918 influenza pandemic, and communicate the need for precaution to their communities. As such, **oral traditions provide historical continuity to the Covid-19 pandemic and gear Indigenous communities to deal with future potential hurdles**. A key example of this is an Alaskan partnership between Elders and local youth to record and explore the effects of the 1918 influenza pandemic on their community, **ensuring historical memories and community resilience is passed on to youth**.

Knowledge gaps and areas for potential action

- **Provide a variety of methods of communication to northern communities**, such as radio channels and in-person resources. In particular, recognize that **some individuals in the Arctic are missed through commonly used channels of communication** as they do not have a phone line, TV or internet access.
- Seek to **understand how communities that are not connected to mass media solutions receive public health information** and how this affects their response to Covid-19 and public health crises.
- **Focus on the effects of Covid-19 on nomadic communities** that may not have consistent access to mass communication or necessary public services while maintaining conditions of self-isolation.
- Draw attention to **the perception of northern and Indigenous communities towards state and local government responses to the pandemic**. Levels of trust between governments and the communities they serve should be examined to better understand its effects on public health recommendation uptake.
- Examine **discrepancies between what is understood to be essential services and resources** by northern communities and governments.
- Examine the **use of public health apps** to track infections and **potential privacy issues** surrounding this.
- Use public communications case studies to assess and better plan **how to convey the urgency and potential impacts of the pandemic to communities**.

- **Ensure continuity of cultural practices during Covid-19 and continue to maintain contact with Elders and hunt.** This fosters mental well-being of northern communities and is a key factor in their continued resilience.

1.5 Risk management and mitigation

The **Arctic States have taken different approaches and implemented varying measures** to contain the spread of Covid-19 in their northern jurisdictions. Overall, it can be argued that **most Arctic States and communities have so far been successful in managing and mitigating the spread of Covid-19 in their northern jurisdictions.** In unitary states (Finland, Sweden, Norway and Iceland), national measures have guided the response and mitigation measures, while in federal states (and the Kingdom of Denmark) each level of government has had their own role in establishing risk management and mitigation measures.

What is the reason for the low rates of infections we currently observe in most parts the Arctic? **Remoteness is likely one factor, as the disease has not been able to spread as quickly** into less populous, isolated Arctic towns and villages. Even where the national level response has been the key in responding to the pandemic, some Arctic Indigenous communities – especially in North America and Greenland’s self-rule – have closed borders to curtail the spread of Covid-19. This is likely due to the **historical awareness of pandemics and diseases** among Arctic Indigenous peoples and regional health authorities, notably the 1918 influenza, raising the levels of alertness and concern within these communities (also see [historical context in the introduction](#)). In general, **remote communities have an advantage in these situations since they can keep track of people** entering their areas, which is nearly impossible in larger cities. On the other hand, if and when the virus is able to penetrate these communities, there will be many challenges to overcome. For example, there is **no immunity to the disease**, the **capacity of the health care system is often quite limited**, and rapidly transporting a sick person great distances to receive specialized care is difficult.

In addition, many Arctic communities have a higher prevalence of **underlying health conditions** that are risk factors for more serious Covid-19 illness (see [section 1.3 on patient care](#)). Some regions, particularly the European Arctic, have proportionally more elderly persons than in the South. Furthermore, as is discussed in several sections of this briefing document, housing in

many parts of the Arctic is often inadequate – with small crowded houses or nomadic tents. This creates **challenges for social distancing and hygiene**.

Because of these conditions and challenges, it is of utmost importance to put in place effective measures to prevent the virus from entering these communities. Even if infection rates have been low in much of the Arctic until now, **it is important to recall that additional waves may come as states lift restrictions**.

The dominant approach taken by governments and organizations to date has been to control peoples' movements so that the virus does not enter the community or the sub-region. The ability to maintain these restrictions depends on the type of Arctic community and its connections and dependence on the movement of people in and out of the area. For example, there are outbreaks in the Russian Federation linked to extractive industry projects, which expose dangers to the nearby communities and to nomadic peoples. In general, **Fly-in/Fly-out (FiFo) and seasonal workers are seen as a potential risk**, whether they are miners or working in the tourism industry. In Alaska, fisheries rely on outside workers, who can be seen as a potential transmission threat for some coastal communities.

Most Arctic States have **closed their international borders from unnecessary travel**, which has played an important part in preventing the spread of Covid-19. Currently, as part of lifting the restrictions, governments are considering opening international borders for recreational travel, for instance in the Nordic countries – effectively creating travel bubbles. The Finnish and Norwegian governments have, from the middle of June (15 June 2020) allowed recreational travel to e.g. Norway, Iceland and Denmark without quarantine upon return – and allows also travel to their respective country from those countries.

Perhaps unique to the region, some communities are encouraging people to go out on the land, **to live in traditional ways to reduce the possibility of getting the virus**. Some Indigenous nomads have historical experience of avoiding disease risk areas. Hence, for many nomads, spatial avoidance has been a key disaster response approach for centuries.

Knowledge gaps and areas for potential action

- Produce specific information and gain knowledge of how **northern and Indigenous communities have taken measures to protect against Covid-19**.

- Compile and assess **measures taken to manage the risk of spreading** the virus in **specific industries** (fisheries, oil and gas, mining) and between these workers and nearby communities.
- **Document historical experiences** about how Indigenous and local Arctic residents have reacted to pandemics.
- Keep track of **how easing national and local restrictions influences the spread of Covid-19** in Arctic regions, and what measures are taken to manage and mitigate that risk.

PART II: Consequences of Pandemic and Public Health Responses

Part II of this document reflects the multi-dimensional impacts of both the coronavirus pandemic itself, mitigation responses, and relief packages for Arctic communities and highlights the interconnectedness of health, social and cultural realities, mobility, multiple sectors of the economy, knowledge production, and the environment. It also brings out existing inequalities and vulnerabilities evident in rural and remote communities as well as the importance of developing infrastructural robustness to support community well-being and resilience. This applies to physical infrastructure such as connectivity, transport, health care facilities and equipment, housing and sewage, as well as access to life-sustaining resources, such as fresh water and food supply. Local communities have found innovative ways to adapt to changing and difficult conditions. For example, oral history, traditional knowledge and subsistence practices have provided many Arctic communities with guidance on how to manage risk and protect their most vulnerable. Many Arctic governments have already implemented response and relief packages, and these represent important short-term measures to mitigate the pandemic's impacts on Arctic communities. Longer-term improvements of public infrastructure are an urgent policy priority if sustainable resilience of Arctic communities is to be achieved.

2.1 Impacts on physical well-being and mental health

There are many impacts on the physical and mental health and well-being of those living in the North due to Covid-19 and the measures taken to contain the spread of the virus. When looking at these impacts, it is important to acknowledge the interconnectedness of issues such as mental and physical health, and the dependence of healthy humans on a healthy environment.

One area of concern, and at the same time a sign of resilience of Arctic communities during the pandemic, is **food security**. Food and nutrition security are always a major concern for Indigenous peoples. Unless they harvest from the land and sea, people in Arctic communities rely on grocery stores that get expensive food from distant southern locations. **As the pandemic has threatened fragile supply chains**, several Arctic national and regional governments have brought in supplemental, time-limited support programs to ensure food security. In addition, **many schools have been providing lunch programs** even while school is

provided virtually, which will in some cases continue into the summer to address food and nutrition security for youth.

Moreover, in the face of the pandemic, a positive trend related to food security has been observed. Communities are looking to **traditional/country food resources** and improving gardening efforts to deal with food and nutrition security. In Alaska and Chukotka, whale hunts have provided a source of healthy food for communities. Access to country food is an important component of health and well-being for all Indigenous peoples. This in turn is linked to a healthy environment and points to the need to ensure the health and sustainability of the species on which people rely. People are also sharing recommendations on ways to stay healthy and lessen the likelihood of complications related to virus' with **traditional plant medicines**.

In addition to the issue of food security, the pandemic and measures implemented to contain the spread of Covid-19 cause and exacerbate **mental health issues through elevated stress levels, fear and stigmatization**. People fear contracting the disease and losing relatives, and the pandemic is also triggering the **historical trauma of past pandemic diseases** that wiped out whole communities. There is also stigma attached to the virus, compounded by the fact that many Indigenous peoples have historically felt stigma through colonialism, and the **infection can leave a mark of disgrace for those infected in communities**.

In addition, **unemployment is at historical highs**, which hits rural communities especially hard, as there are already high levels of unemployment. The push to open communities to resource development and fisheries during the busy summer months **has many concerned about their health**.

In order to address these issues, resources and information are being provided to citizens regarding coping with the stress of and well-being related to Covid-19, including being kind, ways to stay physically healthy and address mental health, as well as details on resources specific to families and children and first responders. A positive effect is also attained by empowering rural communities to stop or limit travel with quarantine policies in cooperation with regional airlines and industry partners. This ability encourages **self-governance and empowerment of communities** and makes them feel safer.

Some of the **steps taken to fight the pandemic, including social distancing and isolation, are foreign to Arctic peoples and they take an additional toll on people's mental health and well-**

being. One example is the intergenerational physical distancing between young and Elders, something that is completely foreign in all Indigenous cultures and has been identified as an important issue by Saami, Aleut, Inuit and other Indigenous peoples. This separation causes stress for young children who cannot be with their grandparents, since these adults are often their closest relative and sometimes fill a parenting role. Isolation has created challenges to mental and emotional well-being of Elders who are especially isolated, and more so if in a home or assisted living facility.

There have also been reports of **increased domestic violence** due to quarantine and staying at home for longer periods of time. Concerns of **increased child abuse and neglect**, as schools being closed take away possible oversight and intervention by seeing children in need. In addition, there are concerns of **increases in substance misuse** due to sheltering in place and the lack of ability to attend in-person substance abuse support groups.

While connection to cultural activities would normally be a way to stay healthy, the **lack of social interaction** affects people. There are reports of social media fatigue and conference call burnout with increased use of technology related to sheltering in place. Many desire a more personal connection that technology does not give. However, some report that there has been a deeper connection to family, friends and colleagues due to physical distancing – as they are making time to call or video chat, which they did not before outside of work or meetings.

The measures taken against the pandemic also create health care infrastructure challenges due to the heightened focus on screening and treating Covid-19. Many have had to forgo preventive visits that have affected vaccination rates, health screenings, primary care and elective procedures (see [section 1.3 on patient care](#)). Health systems have reported **dramatic reductions in their third-party payor, insurance or Medicaid income that are affecting other preventive programs** that could be resourced through this revenue.

This loss of revenue has also caused delays in preventive maintenance and infrastructure improvements. The lack of access to higher levels of care in rural community health centers adds additional stress to those facing the infection. This includes medical care and access to hub community hospitals. The ability to collect data and monitor the public health impact of Covid-19 has been challenged and was already limited because of the lack of internet and connectivity in many Arctic communities. Those with access to internet and social media have more resources than those without, creating issues of equity when it comes to virtual support.

Finally, the coronavirus outbreak also underlines the importance of the environment. There are reports of **air and water quality improvements along with less disruption to the calving season of sea and land animals** due to decreased air, sea and land traffic. There have been more whales caught this season, providing nutrient-dense food to northern communities. Meanwhile, as we deal with Covid-19, **climate change is still well under way and at alarming rates in the North**. Alaska is predicted to have another warm, dry summer with potential fires ensuing. This adds to the mental and emotional stress. The need to keep up ongoing research and addressing infrastructure needs with a pandemic underway is a challenge. There is a need for the alignment of policies and best practices in order to control Covid-19 and promote well-being in the Arctic States.

Knowledge gaps and areas for potential action

- Establish **emergency programs to ensure food and nutrition security** for northern and Indigenous communities, including programs tailored to youth.
- **Heighten awareness about stigmatization for people infected by Covid-19** in Arctic communities and develop tools and support programs to reduce its impact on individuals.
- **Identify measures to reduce the vulnerability of Arctic communities** that are in contact with essential and outside workers traveling to the North.
- **Empower communities to manage local issues related to stress and well-being** during pandemics, in particular acts of kindness, healthy practices and support for mental health.
- Develop tools to **maintain health-related research and address health-related infrastructure needs** during a pandemic.
- **Share best practices and coordinate policies to help control Covid-19** along with ways to **promote well-being** in Arctic States.
- Monitor and address the potential **increase in substance misuse due to sheltering in place and the inability of individuals to seek support through in-person substance abuse support groups** because of physical distancing.
- Assess **how the coronavirus has impacted the environment** and Arctic communities.

2.2 Impacts on regional and local economies by sector/industry

The data on economic impacts on regions and communities in the Arctic is extremely limited, and thus the summary presented below relies on preliminary datasets, case studies and general understanding of economic processes in the region. It is evident, however, that **the coronavirus pandemic has impacted Arctic economies**. These impacts can be categorized as:

- **impacts of containment/mitigation/reopening policies** (e.g., closures, cancellations, travel bans, quarantine, reopening regimes);
- **impacts on demand for goods and services** (e.g., drop in demand for fuels, travel, leisure; spike in PPE, medicine, food) and,
- **impacts on supply** (e.g., factory shutdowns, store closures, supply chain interruptions, labor force issues).

In addition, the economy is affected by economic relief and recovery measures, such as relief/stimulus packages and regulatory changes aimed at supporting economic recovery. The impacts could also be viewed as direct (e.g., loss of revenue, taxes), indirect (e.g., adjustments in supply chains) and induced (e.g., reduction in consumer spending). Currently, observed impacts fall within direct and indirect.

Although Covid-19 impacts will vary between economic sectors and among Arctic regions, **most components of the Arctic economic system have been or will be impacted by the pandemic**.

One common characteristic of the Arctic regions is their **reliance on global trade**, and specifically on specialized exports such as oil, natural gas, minerals and fish, while also depending on importing vital necessities such as fuel, food, equipment and more. Thus, any interruptions in trade deeply affect the Arctic.

Traditional economies

As discussed in other sections, the current health crisis represents both challenges and opportunities for traditional economies. For reindeer husbandry, Covid-19 resulted in **declining demand for reindeer products** (it is still uncertain how the pandemic will influence the price of reindeer meat), and difficulties with crossing jurisdictional boundaries with reindeer herds under the restrictive measures (promptly addressed in most cases). However, the decline in tourism and extractive activities may reduce potential conflicts between reindeer herders and the tourist companies and lower fuel costs will help with the bottom line.

In many jurisdictions, traditional hunting, fishing and other activities have been exempted from some quarantine measures or recognized as ‘essential.’ In some areas, the role of the traditional economies in food security has increased and engagement in subsistence expanded as a result of the pandemic.

The Indigenous cultural economy has also been impacted by disrupted markets and limited mobility of people and goods. Although some jurisdictions provided support to Indigenous businesses and related traditional activities (e.g., Canada, the Russian Federation, Finland), the lack of timely and substantial relief may result in losses extending beyond the economy itself.

Resource sector

The rapid and deep downturn in oil prices has created disruptions and reduction of oil and natural gas production in the Arctic. For example, ConocoPhillips is cutting North Slope production by 20 percent, and Novatek’s exports dropped by 28.4 percent¹.

Due to Covid-19-related restrictions, as well as declining demand and transportation issues, mining operations have downsized, shut down or struggle to resume. Fly-in/Fly-out (FiFo) workers have been severely affected by Covid-19 outbreaks causing interruptions (e.g., Sabetta, Varandei, Chayanda and Belokamenka²) and concerns over the spreading of Covid-19 to local populations. Some companies saw elevated operating costs. For example, the Red Dog Mine recorded a 11 percent first quarter increase³). In addition, companies halted or reduced exploration that can cause an immediate loss (e.g., exploration spending in Nunavut was to be about \$115.7 million USD in 2020⁴) and mass layoffs by drilling companies, but also **undermine the long-term vitality of extractive industries in the Arctic.**

Fisheries are bracing for major impacts. Firstly, they rely on seasonal workers, and thus are vulnerable to labor shortages and Covid-19 spread. For example, the Bristol Bay fisheries in Alaska generates \$1.5 billion USD dollars and employs more than 12,000 seasonal workers. Secondly, there have been issues with demand and transportation to Asian markets (China). Finally, maintaining Covid-19 safety on board of fishing vessels creates new challenges and costs.

Manufacturing and technology

Manufacturing suffered from labor force issues, extra costs and supply chain interruptions. Among severely affected industries is fish/seafood processing, which faces both a **potential shortage of seasonal labor** and increased costs to ensure Covid-19 workplace safety.

In other sectors costs were also considerable. Nornickel allocated over \$140 million USD to combat the coronavirus outbreak and mitigate its impact on employees and local communities⁵ and OneWeb, a communications company, filed for bankruptcy⁶.

Transportation

Transportation systems in the Arctic are critical for the local economy. Most jurisdictions instituted travel restrictions or bans that are necessary to prevent coronavirus transmission. As discussed in [section 2.7 on infrastructure](#), the major impact has been on airlines. In all territories and regions, scheduled flights have been reduced or cancelled except for essential services and supplies, and maintained flights are routinely operated at a loss. Additionally, many of these regional airlines operate smaller, propeller planes, and earn significant income from flying charters. As a result, Arctic-based airlines are placed in a precarious situation. At the same time, selected Arctic airports, e.g. Anchorage, experienced a spike in cargo air traffic.

Other modes of transportation were also affected. Although shipments through the Northern Sea Route increased by 4.5 percent⁷ and other cargo transportation corridors continued operations, many Arctic waters have been shut for tourist vessels for the summer and the rest of 2020.

Tourism and Hospitality

The lucrative aurora tourism industry, which brings thousands of visitors to circumpolar countries each year, was one of the first to be shut down, and will be slow to recover. It is estimated that the tourism and hospitality industries will face severe consequences resulting from travel restrictions, falling demand and seasonal labor decline. The direct economic impacts in some regions will be substantial, but indirect impacts may vary depending on how well the tourist sector is integrated into local economies. **The most devastating impact may be in the cruise industry.** It is expected to **take several years for the tourism and gastronomic industries in the Arctic to return to 2019 levels.**

Conversely, the Arctic may prove to be an attractive destination for tourists during and post-Covid-19. It is seen as clean, safe and sparsely populated and remote, which tourists may value even more in the future.

Retail sector and trade

The retail sector is adversely affected by the pandemic and risk management measures. Generally, **supply of goods to remote communities has been hindered** by cuts in transportation and restriction on transborder trade. However, small businesses in retail and other service sectors are likely to be most vulnerable in larger cities due to high operation costs and competition⁸.

Public sector

The coronavirus pandemic will have a **serious financial impact on the public sector**. Falling tax and royalty revenues and additional costs related to the coronavirus pandemic may diminish government support for public services, institutions and businesses. The loss of public services and subsidies may increase the incentives to relocate. This said, in many Arctic jurisdictions the public sector and its employees, who often provide essential services, have been supported and received relief and recovery funds.

Labor and human capital impacts

Most Arctic regions recorded increases in unemployment filings and rates. For example, in Alaska, with the entire working-age population around 500,000, 65,000 people who normally would have been employed were not working by the end of April 2020⁹. Covid-19-related unemployment hits women and young people especially hard¹⁰. Seasonal workforce will also be greatly diminished, affecting extractive industries, fishing, construction, food processing, tourism and hospitality. At the same time, some critical sectors, such as health care, suffer from current or potential understaffing. Additionally, there are **concerns that unemployment may trigger the flight of human capital**, especially qualified workers, who will leave the region seeking opportunities elsewhere. This can further complicate the recovery and compound an already difficult demographic situation, as well as exacerbate poverty further¹¹.

Relief and recovery measures

Arctic jurisdictions implemented **relief and recovery measures** at the national, regional and, occasionally, local levels. The packages often include funds for unemployment insurance, support for regional and municipal budgets, loans and subsidies for distressed companies, payments to individuals, money for medical needs and more. Some contain targeted programs for Indigenous communities, reindeer herders, essential services (clean water, health care, food, connectivity, etc.). Examples include the US CARES Act (over \$1.5 billion USD to Alaska) and Canadian Emergency Response Benefit (CERB) (\$130 million CAD for territorial governments and an additional \$45 million CAD for the Inuit land claim regions). Iceland's economic response to Covid-19 is expected to reach seven percent of the GDP – or \$25 billion USD. Regional relief and recovery initiatives have been approved by the territorial governments in the Canadian North, by the Russian Federation regional authorities and the State of Alaska ("Six Points Plan"), among others. However, economic response efforts are helping, but are also being reported as difficult to understand and with potential for inequity.

Knowledge gaps and areas for potential action

- **Focus on data collection and community engaged economic analysis, especially at the regional and local levels.** More data are needed to develop a better understanding of the Covid-19 economic impacts in the Arctic. More data are necessary across the wide range of economic indicators and geographical hierarchies, but most urgently at the local/community level.
- **Assess economic impacts in key industries, including** the resource sector (extractive industries, fishing), tourism, transportation (accessibility, costs), services (especially basic services, such as healthcare, retail, and public services) and traditional economies. Data and assessment of indirect and induced impacts is necessary. These include indirect changes in supply chains, adjustment in production and transportation costs, reduction in consumer spending and cuts in government contracting, etc.
- **Address food supply and food security in the short- and long-term.** More understanding and action are needed in respect to the implications of the Covid-19 pandemics food supply and security, including availability, affordability, and quality of food.

- **Approach traditional and local economies as a source of resilience.** Arctic communities may demonstrate strengths and resilience by relying on both traditional economic activities of the Indigenous peoples and localized innovative business solutions.
- **Prioritize economic diversification and sustainability for economic recovery efforts.** Channelizing economic recovery efforts to support the diversification of Arctic economies and ensuring their sustainability to future crises may constitute the most effective and lasting response to the Covid-19 economic recession.
- **Improve physical, digital and financial infrastructure** to attain higher resilience of economic and social systems in the Arctic, and support future development of local businesses and communities.
- **Focus on targeted, equitable, long-term and locally-driven economic recovery** investments with an emphasis on most affected population groups, communities, sectors and regions.
- **Invest in local human capital**, while providing safe and healthy conditions for the non-resident labor force. Development and retention of the local human capital is a priority for the post-Covid-19 Arctic. However, relying on non-resident labor force is unavoidable in certain regions and sectors. There is a need to understand and implement measures and mechanisms for a safe deployment of these workers in the Arctic under current and future pandemics.

¹Staalesen, A. (2020). Novatek says new Arctic projects will proceed as planned, despite a sharp drop in LNG exports. *Arctic Today*, 13 April. See: <https://www.arctictoday.com/novatek-says-new-arctic-projects-will-proceed-as-planned-despite-a-sharp-drop-in-lng-exports/>

²Quinn, E., Sevunts, L., Leiser, M. (2020). Roundup of Covid-19 Response around the Arctic. *The Barents Observer*, 15 March. See: <https://thebarentsobserver.com/en/node/6581>

³Lasley, S. (2020). Red Dog zinc output not slowed by COVID. *Mining News*, 23 April. See: <https://www.miningnewsnorth.com/story/2020/04/24/news-nuggets/red-dog-zinc-output-not-slowed-by-covid/6257.html>

⁴Georg, J. (2020). COVID-19 could have big implications for Nunavut's mining industry. *Arctic Today*, 7 April. See: <https://www.arctictoday.com/covid-19-could-have-big-implications-for-nunavuts-mining-industry>

⁵Nornickel. (2020). Nornickel updates on the business impact COVID-19. *Company website*, 30 April. See: <https://www.nornickel.com/news-and-media/press-releases-and-news/nornickel-updates-on-the-business-impact-covid-19/?dateStart=46800&dateEnd=1591912799&type=releases>

⁶Humpert, M. (2020). OneWeb Bankruptcy Leaves Plans for Arctic Satellite Broadband In Limbo. *High North News*, 14 April. See: <https://www.highnorthnews.com/en/oneweb-bankruptcy-leaves-plans-arctic-satellite-broadband-limbo>

⁷Staalesen, A. (2020). Coronavirus does not stagger growth on Northern Sea Route. *The Barents Observer*, 8 May. See: <https://thebarentsobserver.com/en/industry-and-energy/2020/05/coronavirus-does-not-stagger-growth-northern-sea-route>

⁸Zamyatina N. (2020). Long-term effects of coronavirus: features of the north and the arctic. *Vestnik ARGO*, Vol.9. 131-133.

⁹Alaska Department of Labor & Workforce Development (2020). Seasonal jobs and COVID-19. *Alaska Economic Trends*, May 2020. See: <https://labor.alaska.gov/trends/may20.pdf>

¹⁰Bye, HG. (2020). Unemployment in the High North: Increases Amongst Youth and Women. *High North News*, May 2020. See: <https://www.highnorthnews.com/en/unemployment-high-north-increases-amongst-youth-and-women>

¹¹Business Index North 4th annual report: Sustainability in the Arctic: What? How? And Why? See: <https://businessindexnorth.com/reports/?Article=71>

2.3 Impacts on social and cultural environments

Covid-19 presents a threat to the unique social and cultural environments of many Arctic communities – environments that were already under stress before the pandemic. The experiences of Arctic Indigenous peoples with past pandemics are important factors that contribute to their current vulnerability. Furthermore, as discussed in section [2.4 on vulnerable persons](#), the **current risks to Arctic Indigenous peoples are further defined and reinforced by long-standing inequalities**. For example, according to a report by the Canadian Library of Parliament on the Canadian Arctic, “52 percent of [Inuit] homes are crowded, and people are more likely to live in poverty, lack consistent access to enough healthy food, and have underlying chronic diseases (...).”¹ According to the 2018 US Census data, 23.81% of Indigenous peoples in Alaska live in poverty compared to an overall rate of 10.8%.² In Russia, low household income and education levels, poor housing conditions, inadequate sanitation and unemployment may translate into a higher risk of Covid-19 spread.

Overall, these pre-existing vulnerabilities and inequalities have the potential to amplify the impact of Covid-19 in remote Arctic communities – in particular, Indigenous peoples’ ability to meet their **social and cultural needs** (e.g., education, cultural teachings, Indigenous subsistence cultures). However, while the current pandemic serves to **illuminate the threats to the cultural and social fabric of Arctic communities**, it has provided many **opportunities for communities to demonstrate their resilience**.

A traditional way of life

The Russian Association of Indigenous Peoples of the North (RAIPON), has called on governments to quickly **provide subsidies to support the most vulnerable** Indigenous peoples. At the same time, nomadic ways of life and land-based activities of many other Arctic Indigenous cultures, which include seasonal reindeer herding, fishing and hunting, may serve as a form of physical distancing or “lifestyle associated quarantine.” **However, physical distancing between youth and Elders has caused distress for young children who cannot be with their grandparents and close relatives.** As discussed in [section 2.1 on impacts on physical well-being and mental health](#), these conditions are especially felt in Indigenous communities where multigenerational families are the norm and physical distancing has prevented family members from gathering and celebrating key milestones. For example, current restrictions mean that funerals and end-of-life ceremonies have been postponed and minimized.

Remoteness and resilience

Poverty and inequality go hand-in-hand in many Arctic Indigenous communities where distances and weak supply chains make many rural and remote communities vulnerable to disruption. However, while remoteness of northern communities presents significant challenges, it can also provide a means of protection from the pandemic. In many places, **financial supports have contributed to stronger social systems and provided opportunities for people to engage in subsistence activity and have access to country foods.** This, in turn, makes it easier to self-isolate.

In the Yamal-Nenets Autonomous District, where more than 18,000 nomadic people live, there were no reported cases of Covid-19 by the end of April. The same was true for other Indigenous peoples in the Nenets, Chukotka and Taimyr districts. Infection rates in Indigenous communities of northern Canada were also very low due to quick action to restrict incoming flights to only essential workers and essential food supplies.

Social relationships

Cultural and sports activities have been canceled or postponed across the Arctic – from basketball tournaments in Alaskan villages to hockey leagues in the Canadian Arctic to annual celebrations like the Muskrat Jamboree in Inuvik and Toonik Tyme in Iqaluit. One of the earliest cancellations was the 2020 Arctic Winter Games, a multi-sector event that draws athletes from around the circumpolar North, and which was scheduled to take place in Whitehorse, Yukon in

mid-March. **These events provide the glue for northern communities** and their absence adds to **mental stress and uncertainty about the future**.

Teaching and learning

Public schools have closed, universities have shut down and courses have gone online in the Arctic. In many Arctic communities, **the pandemic has also affected childcare and school lunch programs**. However, governments and organizations in various regions have taken steps to mitigate the impacts on Arctic youth:

- The Coronavirus Aid, Relief and Economic Security (CARES) Act in the United States provides funding and flexibilities for States to respond to the Covid-19 emergency in K-12 schools and provides a variety of waivers for assessments, accountability, reporting and funding carryover.
- In Canada, the national broadcaster recently reported “an explosion in informal, **on-the-land learning** in the Canadian Arctic.”

In addition, digital learning has been met with mixed success due to poor connectivity in some Arctic communities. As discussed in [section 2.7 on infrastructure](#), this serves to underline existing **disparities between the North and South**. Although, once again, actions are being taken to support youth to participate in this new learning environment:

- In Fort Resolution, an Athabaskan community, the school offered **drive-in internet access** to help students stay connected because a majority of the school's approximately 105 students have no or inadequate internet at home.
- The Mastercard Foundation provided Inuit Tapiriit Kanatami (ITK) in Canada with \$1 million CAN dollars to help students make the difficult transition to online learning. The money was divided and disbursed by the four Inuit land claims administrations.

Innovating through tradition

The **significant role of Indigenous oral history and knowledge**, passed down from generation to generation in Arctic communities, has helped individuals and communities explain and understand the threat of Covid-19. Knowledge holders have traditionally helped maintain cultural integrity in the face of adversity, such as pandemics. In particular, hunting, fishing and harvesting activities are vital **subsistence practices** that enable **resilience and adaptation to changing and difficult conditions**. Specific examples include:

- The Gwich'in Tribal Council **provided \$70,000 to each of its community for hunting, wood gathering, traditional medicine** gathering and other activities that fit the community response plan to Covid-19 over the next several months. These funds support Gwich'in who would not otherwise be able to be on the land because of the cost of wood and fuel, food, First Aid equipment, transportation and other items suitable to their situation and culture.
- Social media has helped promote '**culture as medicine**' in many Arctic communities, with traditional dances, drumming and wisdom from Indigenous ancestors shared online, despite the challenges of physical distancing.
- **Inuit-specific online activities** have also been developed, such as the apps, websites and games created by Inuit Tapiriit Kanatami (ITK) and provided in Inuktitut and Inuvialuktun. These online tools include graphics to explain physical distancing and other pandemic safety procedures.
- **Traditional medicine and growing gardens** have also gained interest. In Athabaskan communities, sacred fires are lit and tended by volunteers, which place the ceremony within the boundaries of physical distancing regulations.
- Using **film as a tool to share the impacts of the pandemic** has also been explored. In Scandinavia, the International Saami Film Institute had invited Saami filmmakers to apply for small grants to produce short films about the Covid-19 situation. In total, 15 short films have been funded and will show experiences of the lockdown and the virus in the Arctic from a Saami perspective.

Knowledge gaps and areas for potential action

- Recognize the opportunity to **redesign northern economies and address inequalities by making investments in communities**, prioritizing basic infrastructure such as housing, water and sewer, internet and ensuring access to health care.
- **Acknowledge and address the challenges Arctic Indigenous peoples face** from compounded threats to basic health, well-being and cultural integrity.
- **Support Arctic communities to implement innovative approaches to strengthen cultural practices** during and after the pandemic.

- **Ensure that frontline workers have knowledge of Indigenous peoples' cultures and languages** to facilitate equal access to services by all inhabitants. To support this objective, future cooperation could include healthcare education and strengthening of educational institutions.
- **Prioritize investment in education that takes a multi-generational approach** and includes increased support for on-the-land activities and skill development as a route to resilience building.

¹Fryer, Sara and Collier, Brittany (2020). Inuit Nunangat and COVID-19. HillNotes. *Library of Parliament, Canada*. <https://hillnotes.ca/2020/05/26/inuit-nunangat-and-covid-19>

²United States Census Bureau 2018. Poverty Status in the Past 12 Months. American Community Survey. Table S1710. <https://data.census.gov/cedsci/table?tid=ACSST5Y2018.S1701&g=0400000US02&hidePreview=true&t=Income%20and%20Poverty>

2.4 Impacts on vulnerable persons

Vulnerable persons are defined as those who are **disproportionally exposed to risk** and often include children and youth, older populations¹, individuals with a disability or suffering from mental health conditions or addiction, individuals at risk for suicide or living under abusive conditions, and others from a gradient of socioeconomic groups that may struggle to cope financially and mentally with the Covid-19 crisis. **Vulnerable persons in rural or remote communities are often at greater risk due to limited access to health services and other necessary infrastructure.**

To help reduce the risks posed to vulnerable populations in the context of Covid-19, the World Health Organization (WHO) recommends adherence to strict social distancing guidelines, encourages routine handwashing and sanitizing and advises consultation and medical attention if symptoms do arise. While these recommendations are appropriate for the general population, they are often **challenging to follow in many regions of the Arctic and particularly in remote Indigenous communities.**

As will be discussed in [section 2.7 on infrastructure](#), in many Arctic communities, social distancing and self-isolation is not easily achieved due to **chronic housing shortages and overcrowding of households**. These conditions make self-isolation nearly impossible, thereby fostering the spread of communicable diseases such as Covid-19 between people who may

already suffer from pre-existing comorbidities. In some cases, housing shortages have also led to a **growing homeless population** who are disproportionately susceptible to disease. Support systems for the homeless, and shelters in particular, are often lacking in Arctic regions. Where shelters do exist, the demand often surpasses capacity, leading again to over-crowding.

Housing conditions in many parts of the Arctic have created additional vulnerabilities in populations already susceptible to health-related inequalities.

As was discussed in sections [1.3 on patient care](#) and [2.1 on impacts on physical well-being and mental health](#), these conditions are compounded by the fact that in many Arctic regions, **access to critical services and health infrastructure is limited**. Health systems in many Arctic regions are overstretched under the best of conditions but the demands of Covid-19 are exceeding staffing, laboratory services, infection control and monitoring capabilities. The delivery of critical health services varies by Arctic State, but the disparities between urban centers and remote Indigenous communities are common and most pronounced. Whereas the more populated capital centers in countries like Denmark, Norway and Canada are proving relatively successful at providing critical health services, the more **geographically dispersed settlements in the Arctic are being challenged to provide adequate levels of care**.

Adding additional complexity is the fact that air service in some Arctic regions has been affected by the economic downturn, which in many regions has interrupted regular service. With **airlines serving as the 'lifeline' for many Arctic communities**, the disruptions in service affects the delivery of essential goods and services. **Limited connectivity and broadband service** have also affected the ability of some communities in the Arctic to take advantage of virtual care services (e.g., telemedicine) in areas where there is inadequate health infrastructure. Poor telecommunications infrastructure has also affected the ability of Arctic youth to continue their education remotely through online services because most online educational services assume some basic requirements, including adequate networks, affordable and consistent internet connectivity and basic hardware and software for household users. Unfortunately, these **basic requirements do not exist in many remote Arctic communities**. With plans being made to extend on-line education through the fall of 2020, these students will continue to be disadvantaged by technological inequalities which may delay or even derail their educational goals.

It is difficult to capture the intersectionality of factors and conditions that put some Arctic residents at heightened risk of Covid-19. We can say, however, that the risks associated with Covid-19 are **compounded by the significant and historically entrenched inequalities** that

many Arctic peoples continue to experience. When you consider the high rates of poverty, food insecurity, pre-existing medical conditions, crowded and unhealthy living conditions, lack of clean water, limited access to health care and limited information connectivity, the vulnerabilities become apparent. Yet, **even those who are not particularly vulnerable at this stage of the Covid-19 pandemic may become vulnerable depending on the policy response.**

Policy responses to mitigate impacts of Covid-19 should also include a careful consideration of the impacts on the most vulnerable persons in society. **The effect of this pandemic on these often-overlooked people has not yet been well documented neither in the Arctic region or globally.** A case in point is “emerging evidence of the impact of the recent global pandemic of Covid-19 on violence against women and girls”².

Emerging data across the world indicates that restrictive measures – with increased stress, anxiety, loss of jobs and financial strain, coupled with cramped and confined living conditions – may be leading to an escalation in violence in terms of frequency and severity. Of particular concern is **domestic violence, including coercive control, sexual violence and for children and youth as co-victims and witnesses to violence.** These concerns are echoed across the world with reports of an increase in cases of domestic violence (France, Canada, Germany, Spain, United Kingdom, United States, Iceland³, the Russian Federation, the Kingdom of Denmark) and a higher demand for emergency shelters and in the frequency of helpline and emergency calls (Cyprus, Singapore, Argentina, Canada). At the same time, due to restrictive measures, **essential services may be in a compromised state** and unable to adequately provide for individual needs. Psycho-social support for rape victims may be disrupted. **Rural and remote populations, including in the Arctic, may be disproportionately affected due to lack of access to essential services during lockdown.**

In light of what we know about the unique circumstances in the Arctic and considering these global trends, policy makers should place special attention on better understanding the impacts of Covid-19 on potentially vulnerable populations in the Arctic and how their **actions can bolster the responsive capacities of Arctic communities** and avoid the deepening of health inequalities and future dependencies. Arctic communities need to be supported to put in place **effective measures to protect and support their most vulnerable.** For example, the Canadian Government has injected federal funding (almost \$100 million CAD dollars) into the construction and operation of 12 new shelters for indigenous women and girls and Pautuutit, an Inuit Women’s Association, has called on the government to specifically dedicate some of these funds to Inuit women⁴.

Knowledge gaps and areas for potential action

- **Encourage effective policy action** in response to the interplay between a lack of essential infrastructure and community resilience.
- **Develop and use common data collection tools and methods** specifically targeted at better understanding of how the most vulnerable are impacted by the pandemic.
- Share experiences and best practices between Arctic States, national and subnational levels, **to facilitate appropriate policy responses and initiatives intended to protect the most vulnerable from “unintended consequences”** of risk management measures put in place to reduce the impacts of the pandemic.
- Promote initiatives between Arctic States that seek to **strengthen communities and support their most vulnerable persons** through innovative tools and approaches.

¹ In the specific case of Covid-19, it has been observed that vulnerable persons include older adults, those with underlying medical conditions (e.g., heart disease, hypertension, diabetes, chronic respiratory diseases, cancer).

² UN Women, 2020. Policy Brief: The impact of COVID-19 on Women. Retrieved online 02.06.2020 from <https://www.unwomen.org/en/digital-library/publications/2020/04/policy-brief-the-impact-of-covid-19-on-women>

³ The Women's Shelter in Reykjavik voiced a significant concern, supported by information from the Police concerning the number of reported cases of domestic violence in Iceland, where Jan-April 2020 showed a 4% increase in violence, 11% increase in domestic violence, compared to the three previous years. Further, that due to the nature of the cases registrations of cases may take place later, leading to a higher number of incidents than already reported. In almost all other infraction categories there was a reduction, explained by the ban on assembly and social distancing.

⁴ Pauktuutit Inuit Women of Canada, 2020. Pauktuutit Inuit Women of Canada urges Prime Minister to reconcile funding of Inuit shelters for women and children. Retrieved online 01.06.2020 from <https://www.pauktuutit.ca/news/pauktuutit-inuit-women-of-canada-urges-prime-minister-to-reconcile-funding-of-inuit-shelters-for-women-and-children/>

2.5 Impacts on knowledge production

General Knowledge Production – *Major Impact*

The coronavirus pandemic has majorly impacted research activities and knowledge production across the Arctic region and in individual Arctic States. **Field research and monitoring have been significantly disrupted** by travel restrictions and stay-in-place orders across Arctic States. In Canada alone, for example, Nunavut has put on hold all planned wildlife research projects and the High Arctic Research Station in Cambridge Bay has been shuttered. In Alaska, national fisheries' services data collection has been postponed due to the lack of available ships and travel restrictions. Even the circumpolar Multidisciplinary Drifting Observatory for the Study of Arctic Climate (MOSAIC) has faced significant interruptions. More broadly, **significant research projects face critical gaps**, including related to long-term data retrieval. Graduate students and early-career scientists face particular risks, as they often rely on first or early research efforts to establish their credentials. These interruptions have second- and third-order impacts as well, particularly to local economies.

Nonetheless, many research activities continue, and some projects have adapted to the restricted environment. **Research that can be conducted remotely continues largely uninterrupted**, such as remote data retrieval that rely upon remote surveys, satellite or radar data (e.g., the International Network for Terrestrial Research and Monitoring in the Arctic (INTERACT)). National fisheries' services data collection in Alaska shifted its research methods to **employ drones to capture data**. Research experts highlight **increased importance of hiring more local researchers and experts** to continue vital research efforts and increased usage of citizen science, leveraging the capabilities of amateur scientists and public participation to mitigate research lapses and gaps. The International Arctic Social Sciences Association issued guidelines to members in response to the pandemic, including avoiding travel to Arctic communities and engaging and working through local communities to facilitate remote research.

Covid-19-Specific Knowledge – *Significant Effort*

Arctic States, territories and communities have proactively ramped up **research on the impact, management, prevention and treatment** of Covid-19. As a result, the volume of available information Covid-19 is notably greater when compared to previous pandemics.

Arctic States have invested **significant resources into increasing research and knowledge on the pandemic**, including related to medical and clinical trials and efforts to producing a vaccine. Governments are engaging in shared, cross-border studies, as evidenced by the Nordics, Estonia and Latvia “Nordic Health Data Research Projects on Covid-19”¹ call for 2020-2022 research proposals. More specific to Arctic communities, Indigenous Services Canada funded \$250,000 to a Toronto-based doctor to examine impact of Covid-19 on Canadian Indigenous communities. The U.S. Center for Disease Control and Prevention (CDC) and Department of Health and Human Services (HHS) have also engaged tribal communities with focused funding opportunities related to the pandemic.

Arctic States have invested considerable resources in **sharing research on the pandemic**, a key factor in producing comprehensive knowledge, responses and solutions. The U.S. CDC, National Library of Medicine and WHO run websites with regularly updated, dedicated collections of Covid-19 research articles to promote global knowledge production and sharing. The Norwegian Institute of Public Health keeps track of global Covid-19 research efforts through a map that identifies the intersection of topics and populations.

Arctic Indigenous community leaders stress that research discussions, decisions and activities on and during the coronavirus pandemic related to their communities must include, recognize and **incorporate from the start traditional knowledge and local knowledge (TKLK) to appropriately involve and protect Indigenous persons**. Even so, Covid-19-related research and data gathering in Arctic communities – particularly in remote and secluded areas – carries significant risk. Indigenous community leaders and scientific and medical researchers collectively affirm that **outside researchers must take particular care and precautions** to prevent the spread of Covid-19, citing the disastrous impact of previous pandemics such as the 1918 influenza pandemic.

Impact on Arctic Council Meetings and Work – *Mixed*

Covid-19 has produced a demonstrably **mixed impact on the work of the Arctic Council**. Many of the Council’s engagements, including a **Senior Arctic Officials’ (SAO) and several Working Group meetings** – such as those for the Conservation of Arctic Flora and Fauna (CAFF) and the Sustainable Development Working Group (SDWG) – have been **shifted to a virtual format**, while SAO meeting organizers are exploring possibilities for combined remote participation and voluntary in-person attendance for upcoming engagements. For some Arctic States, designated

representatives to the Arctic Council (e.g., Senior Arctic Officials) have been forced to **split duties or divert attention away from their Arctic Council work** to assist with emergency Covid-19 tasks. Some Arctic Council **Working Group projects scheduled for 2020 have been forced to delay or postpone** planned activities to 2021, such as two Arctic Remote Energy Network Academy (ARENA) workshops and a One Arctic, One Health conference. Arctic-focused meetings beyond the Arctic Council have also faced cancelations, postponements or shifts to virtual format (e.g., Arctic Science Summit Week).

Nonetheless, the work of the Arctic Council and its Working Groups proceeds. The **Emergency Prevention, Preparedness, Response (EPPR)** Working Group is exploring Covid-19 impacts and lessons learned; in the case of EPPR, particularly related to search and rescue, marine environmental response and radiological incidents. Others, such as the **Arctic Contaminants Action Program (ACAP)**, had already taken steps to promote virtual meetings and therefore are less impacted by travel and gathering restrictions. In light of the pandemic, Arctic States recognize the need to more thoroughly explore and bring attention to Arctic health issues. As such, the Arctic Council and SDWG secretariats have highlighted health-focused SDWG projects such as One Arctic, One Health and Local2Global across websites and social media accounts.

Knowledge gaps and areas for potential action

- **Seek greater inclusion and funding of Indigenous persons**, experiences, vulnerabilities and local and traditional knowledge as well as **capacity building projects** in Arctic communities.
- **Provide and facilitate citizen science opportunities** for researchers and local communities.
- Explore **how interrupted research activities in the Arctic can facilitate accelerated work to enhance the research capacity of local communities and researchers**, and the facilitation of related connections and solutions.
- Promote **collaboration and cooperation across projects** to increase coordinated and integrated activities and solutions.
- Explore new methods to **enhance virtual access, data sharing and harmonization across research projects and activities**.

- Facilitate involvement through **virtual tool and creative solutions for meetings and engagement**, including facilitating the participation of persons in connectivity-challenged Arctic communities and community-based participatory research.
- Address the lack of studies that **explore the circumpolar impact of Covid-19**.

¹RANNIS. (2020, 29 May). Nordic Health Data Research Projects on COVID-19. See <https://en.rannis.is/news/nordic-health-data-research-projects-on-covid-19>.

2.6 Impacts on mobility

The current pandemic has **constrained or restricted mobility in most areas of the Arctic**, with implications for how local inhabitants in the North organize their everyday lives during and after the pandemic. As is the case in many southern areas, in the North, **most regions have decided to introduce travel restrictions and quarantine periods for travelers coming into their jurisdictions as preventive measures**. This has applied to international, inter-regional and sometimes intra-national or even intra-regional travel. As a consequence, mobility has been affected across the circumpolar region with implications to varying degrees. Mobility is an issue that is considered directly and indirectly throughout this briefing document. This section places attention on the importance of mobility in the Arctic and highlights key mobility-related issues.

Living and working in the Arctic

Mobility is a cornerstone of everyday life in the Arctic. Without mobility, **traditional and wage economies in the Arctic are crippled**. For Indigenous peoples, living on the land is their way of life – moving frequently about from place to place – based on the location of terrestrial and marine animals and plants for their livelihood (reindeer, wild animals, berries, herbs, sea mammals, fish, etc.). In addition, for decades people have been moving in and out of different northern areas to **find work on permanent, seasonal or Fly-in/Fly-out schemes** (including for example monthly-based shifts working in the Arctic away from home). Relying on extractive industries and natural resource development wherever those activities take them.

Mobility in rural areas also involves **traveling long distances for procuring goods** – food and other everyday necessities – or waiting for deliveries to **arrive in northern communities**. For example, traveling is an everyday reality to **reach or receive medical services**.

Recognizing the unique Arctic context

All Arctic regions have had to make exceptions regarding mobility restrictions because Arctic communities are **dependent on southern centers for many goods and services**. As a result, **travel is often necessary to ensure that Arctic inhabitants have equal** access to meet their basic needs. Exceptions have been made to allow essential workers to travel into these communities, including medical staff, workers in **extractive industries considered necessary for ensuring production** (oil, gas, minerals), and fisheries.

Nomadic livelihoods and social connections

As discussed in section [2.3 on impacts on social and cultural environments](#), northern nomadic lifestyles have felt the consequences of mobility constraints and restrictions in the Arctic. For example, Arctic inhabitants with family members living on either side of Arctic borders – or in some cases intra-national jurisdictions – have been especially impacted. In Sápmi, **all non-essential border crossings between the four Nordic countries has been suspended**. While these restrictions were lifted in June 2020 for the Saami, the border to the Russian Federation remains closed until further notice. This means that visits for cultural exchange are banned, relatives, partnerships, events etc. among Nordic and Russian Saami are **suspended for an undetermined period**.

Mobility can also be understood as an asset for Indigenous peoples that rely on **subsistence as a risk-minimizing strategy**. In this respect, enabling mobility for subsistence purposes is important in areas of the Arctic where the coronavirus pandemic is not present. **Support for subsistence mobility also means avoiding unnecessary mobility into settlements** where people may contract the virus. Evading has been a traditional strategy for centuries for Indigenous peoples when dealing with problems including but not limited to health. In many circumstances, **funding has been provided for exceptional mobility measures** to allow people to be **out on the land** to avoid infection.

Mitigating the risk of virus spread

In the Russian, Alaskan and Canadian Arctic regions, one key concern has been that **labour mobility, especially for the extractive industries, can make Arctic areas vulnerable to the spreading of Covid-19**. The dependence on seasonal, Fly-in/Fly-out workers raises concerns when travel restrictions are lifted. **Interactions between these workers and local (Indigenous)**

population increases the risk of spreading the virus, if appropriate risk management measures are not implemented and/or respected. In several Arctic jurisdictions, **isolation measures for transient workforces in the Arctic have been put in place to prevent the spread of the virus to local populations**.

Similar considerations are also relevant for tourism in the Arctic. The **mobility of infected tourists bringing the virus to Arctic communities** is a grave concern in all Arctic areas today. Many authorities, even in very remote areas such as Nunavut, have closed their jurisdiction to outside tourists for the 2020 summer season.

Knowledge gaps and areas for potential action

- Refine policies and rules to restrict longitudinal (North-South) mobility and **enable latitudinal (North-North) mobility**.
- Assess the **long-term implications of transportation infrastructure (air, water, land)**, including patterns, dependencies and the risk of spreading the virus in the Arctic.
- **Develop and fund innovative measures to enhance people's capacity for self-sufficiency** while North-South mobility measures are in force (e.g., enhancing traditional harvesting and herding practices).
- **Recognize Indigenous traditional modes of transportation** such as dog teams, reindeer, horses and respectively designed carriages (sledges, pulkas, etc.) and ways of travelling on the land to increase the prestige of such knowledge.
- **Maintain and strengthen connections between very rural/isolated areas and life-support/life-saving essential services in the Arctic**, especially with regard to air and marine transportation in times of crises in the Arctic (i.e., remaining operational despite the loss of profit).
- **Develop innovative policies and measures to encourage and support northerners to move out on the land for their traditional livelihoods in times of crises**, as a means to reduce the vulnerability of Arctic communities.

2.7 Enabling public infrastructure

Infrastructure limitations in many parts of the Arctic have been a long-standing threat to health, safety and overall resilience. As was discussed in sections [1.3 on patient care](#) and [2.1 on impacts on physical well-being and mental health](#), responding to the coronavirus pandemic in the Arctic requires a careful assessment and understanding of the region's limited health infrastructure (e.g. hospitals, health clinics, laboratories, etc.). In addition, initial actions taken by governments and organizations at all levels (national, sub-national, local) to respond to the pandemic have highlighted the need to strengthen all aspects of the region's 'critical infrastructure' – the *essential* assets and systems that support the physical, social and economic well-being of citizens.

The Arctic is not homogeneous, and the extent and condition of critical infrastructure services vary widely across Arctic geographies. However, based on the input of experts and knowledge holders, the coronavirus pandemic has exposed the **fragility of existing critical infrastructure** in the region, especially in many Indigenous communities. For these communities, the limitations of such critical infrastructure during a crisis dramatically compounds existing risks and vulnerabilities and highlights the urgent need to build more resilient systems.

For example, many remote Arctic communities are highly dependent on air transportation for essential supplies (e.g. food, medical supplies, fuel, equipment) and essential travel. Restrictions and reductions in flights have quickly increased the cost of travel and transporting cargo, created delays in supply chains and, in some cases, challenged the economic viability of the airlines that serve these communities. The pandemic has exposed how great distances and a dependence upon tenuous transportation systems can increase **risk to food and energy security in Arctic communities**.

Stresses on inadequate water, waste management, housing and telecommunications infrastructure in remote Arctic communities have also been amplified by the demands of a **pandemic response**, increasing risk to the health and safety of families. These conditions are especially acute in many Indigenous communities. For example:

- Regular handwashing and sanitation are the most effective defenses against Covid-19, but these measures are far less viable in Arctic communities with **limited access to fresh water** and/or dependence on over-subscribed trucked water supplies. Similarly, many remote

communities do not have **sewer and waste management systems** that enable people to follow recommended isolation and containment protocols;

- **Inadequate, overcrowded, unaffordable and unsafe** housing is another longstanding infrastructure gap in many parts of the Arctic. In addition, homes are often multigenerational, which brings increased risk to Elders and people with underlying health conditions. If Covid-19 spreads to Arctic communities, the inability to appropriately isolate infected or highly vulnerable individuals could lead to rapid community transmission and higher mortality; and,
- The availability and quality of internet and telecommunication systems has allowed people around the world to continue work and education, seek essential services, maintain social contact and receive critical information about policies and programs related to Covid-19 response. Unfortunately, **many parts of the Arctic do not have access to reliable, affordable telecommunications services** (i.e. telephone, internet, television). At a time when the need for telecommunications systems is greater than ever, increased demand has degraded services and left Arctic communities without the important lifeline that is keeping the rest of the world connected.

To their credit, local, regional and national governments and organizations are demonstrating an awareness of the critical infrastructure gaps and weaknesses that exist in the Arctic and have taken steps to mitigate them. Governments have committed funds to support transportation infrastructure (e.g. funding airlines to maintain regular service to remote communities) and temporary housing (e.g. for self-isolation and shelters for homeless and vulnerable populations), used subsidies to address the rising costs of food and essential items, limited cost increases for energy and telecommunications and instituted special measures to reduce the risk of infection from outside sources (e.g. 14-day self-isolation requirements, delaying cruise ship season, requiring advance testing of essential workers).

These actions represent important short-term measures that mitigate the pandemic's health, social and economic impacts on Arctic communities. However, the "stress-test" of these unprecedented events has exposed the urgent need for improved public infrastructure in order to build the long-term resilience of Arctic communities. International agreements such as the UN Sendai Framework for Disaster Risk Reduction, the UN's Agenda 2030 for Sustainable Development, and the Arctic Resilience Action Framework provide guidance for addressing

these limitations, but the pandemic has amplified the urgency of doing so on an accelerated timeline.

Knowledge gaps and potential areas for future action

- Initiate a critical and thorough **regional examination of the infrastructure gaps and weaknesses** that have amplified, and been amplified by, the pandemic.
- Increase community capacity to identify and **test new water, waste management, energy and housing solutions** that meet their needs.
- **Subsidize the option for communities to safely and securely disperse away** from disease vectors such as airports, roads, or crowded facilities during the pandemic.
- **Increase community capacity to respond to an infrastructure crisis** without outside assistance by providing training and youth leadership opportunities.
- Develop a **regional action plan for overcoming the inequity issues** caused by lack of broadband access during disaster response or pandemic emergencies.
- Require Arctic investors to **contribute to community infrastructure resilience as a “cost of doing business”** in the region and incentivize green, resilient investments.
- Establish regional milestones for dramatically **increasing housing stock for under-served Arctic communities**.

PART III: Core Themes and Guidance for the Arctic Council

Parts I and II introduce a broad range of topics – from Covid-19 infection rates in the Arctic to pandemic containment strategies; from the impact of the pandemic on different Arctic industries to the efforts of Indigenous communities to maintain cultural practices. Overall, this briefing document **discusses the unique conditions and characteristics of pandemic management and the direct and indirect impacts of the pandemic on Arctic communities.**

Core themes that emerge throughout the document include:

- The value of enhancing international collaborations to support research and policy actions for current and future pandemic realities;
- The necessity of ensuring that Arctic peoples lead efforts to define and respond to their communities' needs (emergency response, relief measures, health and social care, infrastructure);
- The impact of fragile, sub-standard or absent critical physical and social infrastructure (health care, water and sewage, housing, telecommunications, education, energy, transportation);
- The unique health and social needs and circumstances of Arctic inhabitants, including the value and relevance of Indigenous traditional practices (social, cultural and economic);
- The importance of data consistency, information sharing, observation and research across the Arctic with particular attention to strengthening local involvement and capacity;
- The need to foster and contribute to the resilience of Arctic communities (economic diversification, cultural integrity, social vitality and environmental sustainability).

Figure 1: Covid-19 in the Arctic – Factors Contributing to Resilience and Vulnerability

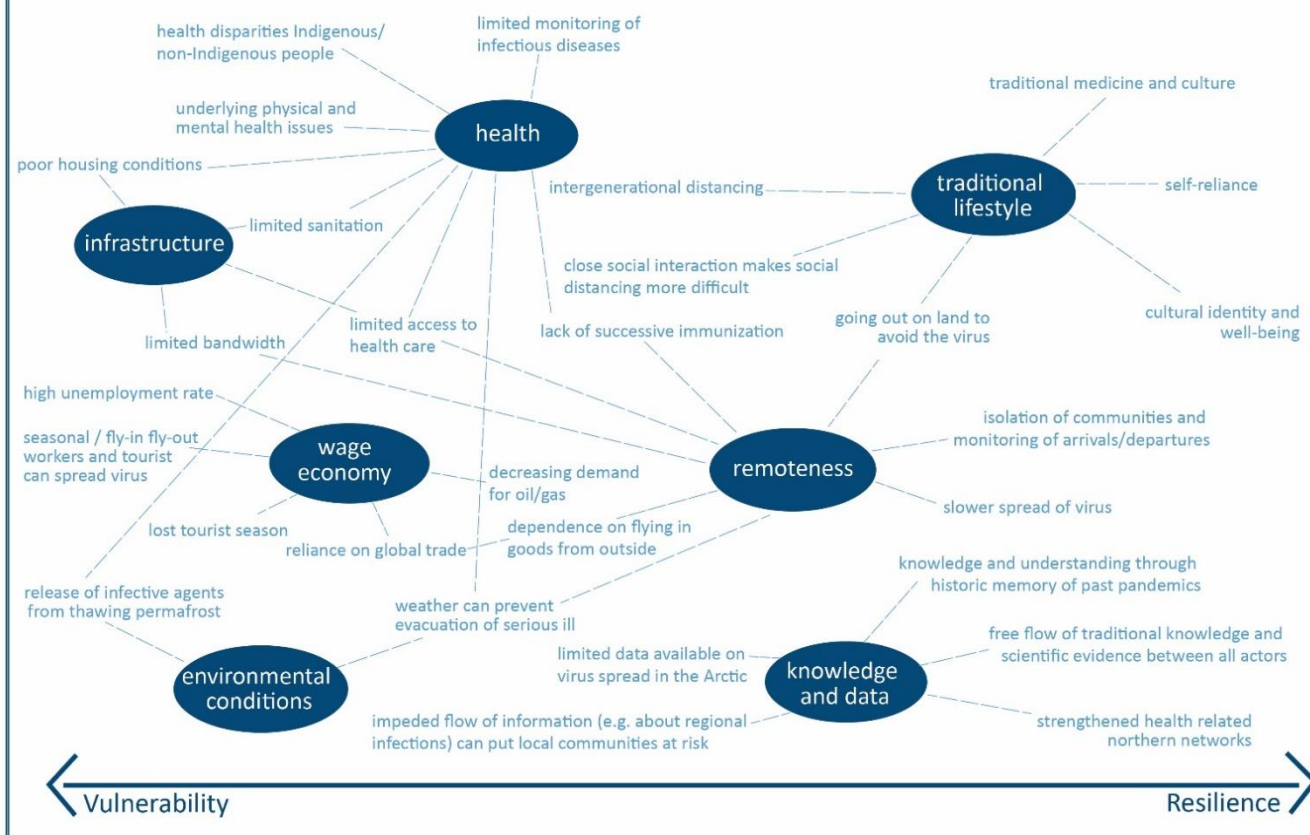


Figure 1 highlights key issues drawn from the information collected. It also emphasizes the many interconnections observed between these issues. Ultimately, this Figure encourages us to **consider where the pandemic exposes or exacerbates the vulnerabilities of Arctic communities** and where it serves **to display or inspire resilience**. It demonstrates that Arctic institutions should focus their attention on where they can **contribute to reducing vulnerability and enhancing resilience**.

Each section in Parts I and II also conclude with a segment on “Knowledge gaps and areas for potential action.” Here, authors present specific ideas for **how our understanding of Covid-19 in the Arctic may be improved and opportunities to take action**. This cumulative list of issues is not intended to be exhaustive; however, it is extensive.

The authors invite Arctic governments and organizations to consider these ideas and how they might inform their efforts in the short-, medium and longer-term.

This briefing document was prepared to support an informed discussion by SAOs about **the role the Arctic Council can play in responding to the Covid-19 pandemic**. Given the mandate of the Arctic Council and the expertise that it has developed over 20 years, the Arctic Council has an opportunity to **inform pandemic management in the Arctic and contribute to the enhanced resilience of Arctic communities** moving forward.

In particular, the Arctic Council is well positioned to consider the following:

Role of the Arctic Council	Potential Activities
Build and strengthen circumpolar networks of experts and knowledge holders to develop common measures and share information	<ul style="list-style-type: none"> • Leverage existing Arctic Council networks of expertise within areas related to health and well-being; • Strengthen the strong cross-sectoral and inter-disciplinary collaboration between Working Group experts; • Connect Arctic Council and other circumpolar networks, including the four regional councils of northern Europe, the Arctic Mayors Forum and other external bodies based in other regions of the Arctic.
Initiate, continue or modify high quality assessments and continuous monitoring	<ul style="list-style-type: none"> • Arctic resilience; • Arctic infrastructure (health, transportation, water and sewer, housing, energy); • Emergency planning and response for pandemics in the Arctic; • Arctic telecommunications and connectivity; • Biodiversity and human health; • Health and well-being; • Education and capacity development; • Community dependencies and self-sufficiency; • Risk communication.

Facilitate and share learning from Arctic innovations and best practices	<ul style="list-style-type: none"> • Sustainable energy; • Food & nutrition security; • Water and waste management; • Pandemic response; • Sustaining social and cultural practices.
Enable and encourage circumpolar projects & initiatives	<ul style="list-style-type: none"> • Human health; • Infrastructure; • Pandemic scenario planning.
Draw on research, traditional and local knowledge and experience to develop recommendations to inform policies and programs of Arctic governments and organizations during and post-pandemic	<ul style="list-style-type: none"> • Patient care; • Community emergency response; • Infrastructure planning and investment; • Economic revitalization and diversification; • Communications and information dissemination; • Supporting vulnerable populations.
Facilitate and encourage policy consistency and alignment across Arctic	<ul style="list-style-type: none"> • Health measures and data collection; • Transboundary mobility and movement of Arctic peoples; • Pandemic risk management measures and procedures.

This list is intended to provide ideas and inspire discussion. Based on this briefing document, **SAOs have the opportunity to provide direction about what role they see the Arctic Council assuming and where more information and analysis may be required** to support their decision-making.

Appendices – Additional Information

Appendix 1 – Links to supporting materials by thematic section

Part I: Existing Public Health Actions & Activities Across the Circumpolar Arctic

Infectious disease monitoring and assessment

- **Arctic Covid-19 Tracker.** ARCTICenter, University of Northern Iowa. (2020). <https://univnortherniowa.maps.arcgis.com/apps/opsdashboard/index.html#/b790e8f4d97d4414b10c03d5139ea5d5>
- **Finnish Covid-19 tracker with information provided by THL.** (2020). <https://experience.arcgis.com/experience/d40b2aaf08be4b9c8ec38de30b714f26>
- **Covid-19 self-diagnostic in Finnish Lapland.** (2020). <http://www.sosiaalikellega.fi/virtu.fi/>
- **Covid-19 self-diagnostic in Canada.** (2020). <https://ca.thrive.health/covid19/en>
- **Covid-19 tracking site for Alaska.** (2020). <https://coronavirus-response-alaska-dhss.hub.arcgis.com/>
- **Canada Covid-19 Situational Awareness Dashboard.** (2020). <https://experience.arcgis.com/experience/2f1a13ca0b29422f9b34660f0b705043/>
- **Norway Covid-19 database.** FHI. (2020). <https://www.fhi.no/sv/smittsomme-sykdommer/corona/dags--og-ukerapporter/dags--og-ukerapporter-om-koronavirus/>
- **Confirmed Corona infections in Sweden.** Folkhälsomyndigheten. (2020). <https://experience.arcgis.com/experience/09f821667ce64bf7be6f9f87457ed9aa>
- **Nordforsk Centre of Excellence CLINF** (Climate change Effects on the Epidemiology of Infectious Diseases and the Impacts on Northern Societies. (2020). <https://clinf.org/about-clinf/>
- **Case study on how Covid-19 spreads: Iceland.** (2020). *Iceland Monitor* (with link to academic article in *The New England Journal of Medicine*). https://icelandmonitor.mbl.is/news/news/2020/04/15/article_on_covid_19_in_iceland_in_new_england_journ/
- **CommunityFirst Covid-19 Roadmap** (2020) is a 3-step online planning tool to support Indigenous communities to Organize, Prepare and Respond to Covid-19. (also available in Inuktitut). <https://www.communityfirstcovid19.org/>
- **Guidelines on data sharing under Covid-19 circumstances** aimed at stakeholders and/or policymakers produced by Research Data Alliance (RDA) (2020). <https://www.rda-alliance.org/groups/rda-covid19>

- **Virtual Conference on Covid-19 Impacts in the Arctic.** Woodrow Wilson Center. (video, May 2020). <https://www.wilsoncenter.org/event/virtual-conference-covid-19-impacts-arctic>
- **Summary of actions and activities taken by the Government of Nunavut and other Northern Indigenous Organizations in response to Covid-19.** (2020).
- **Alaska's Department of Health and Social Services (DHSS) website focused on Covid-19 in the State of Alaska.** <http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/default.aspx> including a specific focus on infectious diseases <http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/default.aspx>
- **Arctic Council news article on Biodiversity and Human Health: Less Biodiversity, More Infectious Diseases?** (May 2020). <https://arctic-council.org/en/news/biodiversity-and-human-health-less-biodiversity-more-infectious-diseases/>
- **Council of State and Territorial Epidemiologists proposes a Standardized surveillance case definition and national notification for 2019 novel coronavirus disease (COVID-19)** (2020).
- **Analytical review on Covid-19 Pandemic in the Arctic: Briefing Material for SAOs,** National Research University of the Russian Federation. (2020).
- **Alaska Coronavirus Response Hub.** (2020). <https://coronavirus-response-alaska-dhss.hub.arcgis.com/>
- **Information about Covid-19 from the Government of the Yukon in Canada.** (2020). <https://yukon.ca/covid-19>

Patient care

- **Arctic Investigations Program (AIP) by the U.S. Centers for Disease Control and Prevention (CDC) that prioritizes monitoring and controlling infectious diseases in Alaska** (with a focus on Alaska Native people and other Indigenous populations across the Arctic. (2020). <https://www.cdc.gov/nceid/dpei/aip/index.html>
- **Alaska's Department of Health and Social Services (DHSS) website focused on Covid-19 in the State of Alaska** <http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/default.aspx> including a specific focus on infectious diseases <http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/default.aspx>
- **Covid-19 tracking site for Alaska.** (2020). <https://coronavirus-response-alaska-dhss.hub.arcgis.com>
- **Alaska Department of Health and Social Services. Data, Statistics and Publications on MCH Epidemiology, Covid-19 Related Surveys.** (2020). <http://dhss.alaska.gov/dph/wcfh/Pages/mchebi/default.aspx>
- **Covid-19 Response Trust Grant Program established for beneficiaries facing complications operating and providing critical services during the Covid-19 pandemic.** Alaska Mental Health Trust. (2020). <https://alaskamentalthrust.org/alaska-mental-health-trust-authority/grants/covid-19-response-grant-program/>

- **Analytical review on Covid-19 Pandemic in the Arctic: Briefing Material for SAOs**, National Research University of the Russian Federation. (2020).
- **Information about Covid-19 from the Government of the Yukon in Canada.** (2020).
<https://yukon.ca/covid-19>
- **Covid-19 in Canada's North – Situation Report.** (May 2020).

Available epidemiological data

- **Arctic Covid-19 Tracker.** ARCTICenter, University of Northern Iowa. (2020).
<https://univnortherniowa.maps.arcgis.com/apps/opsdashboard/index.html#/b790e8f4d97d4414b10c03d5139ea5d5>
- **U.S. National Institute of Health Covid-19 clinical trials projects.** (2020).
<https://clinicaltrials.gov/ct2/results?cond=COVID-19>
- **Case study on how Covid-19 spreads: Iceland.** (2020). *Iceland Monitor* (with link to academic article in *The New England Journal of Medicine*).
https://icelandmonitor.mbl.is/news/news/2020/04/15/article_on_covid_19_in_iceland_in_new_england_journ/
- **International Circumpolar Surveillance program of invasive bacterial diseases is an infectious disease surveillance network of Arctic countries established by the Government of Canada.** (2020).
<https://www.canada.ca/en/public-health/services/surveillance/international-circumpolar-system-invasive-bacterial-diseases.html>
- **Covid-19 information site in Iceland.** (2020). <https://www.covid.is/english>
- **Case study on how Covid-19 spreads: Iceland.** (2020). *Iceland Monitor* (with link to academic article in *The New England Journal of Medicine*).
https://icelandmonitor.mbl.is/news/news/2020/04/15/article_on_covid_19_in_iceland_in_new_england_journ/
- **Iceland's DeCode Genetics tests for Covid-19 immunity.** Focus on specific groups, starting with people who have had confirmed infections, then going on to folks who have been quarantined. (2020). <https://www.decode.com/>
- **Summary of actions and activities taken by the Government of Nunavut and other Northern Indigenous Organizations in response to Covid-19.** (2020).
- **Arctic Investigations Program (AIP) by the U.S. Centers for Disease Control and Prevention (CDC) that prioritizes monitoring and controlling infectious diseases in Alaska** (with a focus on Alaska Native people and other Indigenous populations across the Arctic. (2020).
<https://www.cdc.gov/nceizid/dpei/aip/index.html>

- **Alaska's Department of Health and Social Services (DHSS) website focused on Covid-19 in the State of Alaska.** <http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/default.aspx> including a **specific focus on infectious diseases** <http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/default.aspx>
- **Covid-19 tracking site for Alaska.** (2020). <https://coronavirus-response-alaska-dhss.hub.arcgis.com/>
- **Alaska Department of Health and Social Services. Data, Statistics and Publications on MCH Epidemiology, Covid-19 Related Surveys.** (2020). <http://dhss.alaska.gov/dph/wcfh/Pages/mchept/default.aspx>
- **Council of State and Territorial Epidemiologists proposes a Standardized surveillance case definition and national notification for 2019 novel coronavirus disease (COVID-19)** (2020).
- **Finland provides nation-wide epidemiological data collected by the Finnish Institute of Health and Welfare.** In the Northern part of Finland limitations were observed in the availability of testing equipment but has since then been improved. (2020). <https://thl.fi/en/web/infectious-diseases/what-s-new/coronavirus-COVID-19-latest-updates>
- **Government of Canada Covid-19 infection data in the Territories.** (2020). <https://www.canada.ca/content/dam/phac-aspc/documents/services/diseases/2019-novel-coronavirus-infection/surv-covid19-epi-update-eng.pdf>
- **Information about Covid-19 from the Government of the Yukon in Canada.** (2020). <https://yukon.ca/covid-19>
- **Covid-19 situation in Nunavik, Northern Québec (Canada).** INSPQ. (2020). <https://www.inspq.qc.ca/en>

Public health information sharing, awareness and education

- **Arctic Slope Native Association / Samuel Simmonds Memorial Hospital Covid-19 information (Alaska)** (2020). <https://arcticslope.org/about/ssmh-governing-committee/>
- **Covid-19 information of the Maniilaq Service Area in Alaska.** (2020). <https://www.maniilaq.org/covid-19/>
- **Norton Sound Health Cooperation Covid-19 information in Alaska** <https://www.nortonsoundhealth.org/category/covid-19/> and **recommendations related to subsistence during Covid-19.** (2020). <https://www.nortonsoundhealth.org/wp-content/uploads/COVID19-Subsistence-Safety.pdf>
- **Yukon-Kuskokwim Health Corporation Covid-19 response.** (2020). <https://www.ykhc.org/covid-19/>
- **CommunityFirst Covid-19 Roadmap** (2020) is a 3-step online planning tool to support Indigenous communities to Organize, Prepare and Respond to Covid-19. (also available in Inuktitut). <https://www.communityfirstcovid19.org/>
- **Covid-19 information site in Iceland.** (2020). <https://www.covid.is/english>

- **Iceland's Directorate of Health Covid-19 hub**, with daily press conferences held by the police, Directorate of Health and the Chief Epidemiologist. (2020). <https://www.landlaeknir.is/koronaveira/english/>
- **Status reports by the National Commissioner of the Icelandic Police, Department of Civil Protection and Emergency Management.** (2020). <https://www.almannavarnir.is/tag/raudi-krossinn/> (in Icelandic)
- **Case study on how Covid-19 spreads: Iceland.** (2020). *Iceland Monitor* (with link to academic article in *The New England Journal of Medicine*). https://icelandmonitor.mbl.is/news/news/2020/04/15/article_on_covid_19_in_iceland_in_new_england_journ/
- **Letter of advice from a doctor: fellows from Chukotka living in settlements and in reindeer herding camps.** (2020).
- **Arctic Investigations Program (AIP) by the U.S. Centers for Disease Control and Prevention (CDC) that prioritizes monitoring and controlling infectious diseases in Alaska** (with a focus on Alaska Native people and other Indigenous populations across the Arctic. (2020). <https://www.cdc.gov/ncezid/dpei/aip/index.html>
- **Alaska Department of Health and Social Services. Data, Statistics and Publications on MCH Epidemiology, Covid-19 Related Surveys.** (2020). <http://dhss.alaska.gov/dph/wcfh/Pages/mchebi/default.aspx>
- **Covid-19 tracking site for Alaska.** (2020). <https://coronavirus-response-alaska-dhss.hub.arcgis.com/>
- **Alaska's Department of Health and Social Services (DHSS) website focused on Covid-19 in the State of Alaska.** <http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/default.aspx> including a **specific focus on infectious diseases** <http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/default.aspx>
- **Arctic Investigations Program (AIP) by the U.S. Centers for Disease Control and Prevention (CDC) that prioritizes monitoring and controlling infectious diseases in Alaska** (with a focus on Alaska Native people and other Indigenous populations across the Arctic. (2020). <https://www.cdc.gov/ncezid/dpei/aip/index.html>
- **Alaska hosts several websites specifically focused on Covid-19 information in Alaska.** (2020). <https://covid19.alaska.gov/>
- **Alaska Native Tribal Health Consortium (ANTHC)** (<https://anthc.org/covid19/covid19readiness/>), **Cook Inlet Tribal Council** (<https://citci.org/covid19/>), **Southcentral Foundation** (<https://www.southcentralfoundation.com/novel-coronavirus-covid-19/>) and **Yukon-Kuskokwim Health Corporation** (<https://www.ykhc.org/covid-19/>) all provide specific information related to Covid-19, while some also include specific information and resources for preparing Tribal health leaders and medical professionals for Covid-19. (2020).
- **U.S. Senators in Alaska provide constituents with detailed, specific information regarding Covid-19.** See Senator Murkowski (<https://www.murkowski.senate.gov/issues/issues-and-priorities/covid-19>

[19-coronavirus-information](#)), Senator Sullivan (<https://www.sullivan.senate.gov/coronavirus>) and Representative Young (<https://donyoung.house.gov/constituentservices/coronavirus-resource-center.htm>).

- **Preventive measures in Alaska:** on 10 April 2020, the Governor of Alaska and the DHSS announced additional health guidance designed to combat and mitigate the spread of the virus even though Alaska had not yet reported a single confirmed Covid-19 case (<https://ready.alaska.gov/Covid19/Documents/GOA/03.10.2020%20GOA%20-%20SOA%20Urges%20Alaskans%20to%20follow%20New%20Health%20Guidance.pdf>). Two days earlier, DHSS had released a public statement specifying a number of steps it was taking to respond to the pandemic, many of which had addressed **management and mitigation** (http://dhss.alaska.gov/dph/Epi/id/SiteAssets/Pages/HumanCoV/COVID-19_DHSSResponse.pdf).
- **Senior Alaskan officials instituted Health Mandates** (required) (<https://covid19.alaska.gov/health-mandates/>) and Alerts (advised) (<https://covid19.alaska.gov/health-alerts/>) **designed to address, manage, and mitigate risks and protect public health.** Examples of some of these mandates include: critical infrastructure operations; education; entertainment and dining; fishing vessels; travel restrictions limiting all non-essential travel -- particularly to rural Alaska and remote communities -- to minimize infections in communities with limited capacity and ability to respond to infections.
- **Fisherman's Handbook developed for the Bristol Bay Regional Seafood Development Association in Alaska**, which include guidelines for the region's commercial fishing fleet. (2020). <https://static1.squarespace.com/static/56b0dfb660b5e98b87fc3d52/t/5ec3fc4ecc9a666e61c3e363/1589902415381/BB+COVID+Handbook+v4.pdf>
- **Municipalities and towns in Alaska provide specific information regarding mental health services and support.** (2020). <https://www.namijuneau.org/covid-19-mental-health-resources>
- **National American Indian and Alaskan Mental Health Technology Transfer Center (MHTTC) provides a resource guide for mental health providers during Covid-19.** (2020). <https://mhttcnetwork.org/centers/national-american-indian-and-alaska-native-mhttc/product/resource-guide-mental-health>
- **National Indian Health Board (NIHB) provides a collection of links and information on Covid-19 funding opportunities, including a running tracker of available grants.** (2020). <https://www.nihb.org/covid-19/funding-opportunities/>
- **Support and guidance provided to food establishments** (<https://dec.alaska.gov/eh/fss/food/food-worker-and-establishment-guidance-on-covid-19/>) and **farmers' markets** (<https://dec.alaska.gov/eh/fss/food/farmers-markets/covid-19-guidance/>) **on how to prevent the spread of Covid-19.** *Alaska Division of Environment and Health's Food Safety and Sanitation Program.* (2020).
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- **Alaska Educators and the Coronavirus Outbreak** (resources and tools) (2020). <http://www.neaalaska.org/akcovid-19/>
- **Covid-19 Rapid Response Grants in Alaska.** Established in response to educators' emerging needs, addressing the effects of Covid-19 pandemic on teaching and learning. (includes other links with more resources for students and leaders) (2020). <http://www.neaalaska.org/akcovid-19/>
- **Impact of Covid-19 on K-12 in Alaska** (2020). <https://education.alaska.gov/safeschools/infectiousdisease>
- **Alaska DHSS created specific, focused and information for high-risk groups** (<http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/highrisk.aspx>), families and children (<http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/wellbeing.aspx>), and other specific groups (<http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/populations.aspx>). (2020).
- **Utilization of digital tools during the pandemic and challenges related to it.** (Salminen, 2020).
- **Collecting Experiences: Pandemic Stories and Conversations.** (2020). <https://gwichin.ca/covid?fbclid=IwAR1MFELGEUDXSf3XW7pkAxvNFJk4x5wJhXSZqfTLZ4m9YL5zJf7YPJeKT70>. The project also offers webinars and sharing circles: <https://www.facebook.com/hotiitseeda/videos/1366286553561601/>.
- **Canadian public service announcements about Covid-19** (2020). *Government of Canada.* <https://www.sac-isc.gc.ca/eng/1583781906998/1583781926813> (available in French and English and multiple Indigenous languages)
- **Northwest Territories Association of Communities, Music NWT, and the GNWT campaign to Protect Our Elders Through Covid-19 Crisis.** (2020). <https://www.gov.nt.ca/en/newsroom/nwtac-music-nwt-and-gnwt-team-protect-our-elders-through-covid-19-crisis>. GNWT works to provide materials and videos translated into Canada's official languages (<https://www.youtube.com/watch?v=5SFijt3IKU4>) and also in NWT's Indigenous languages (<https://www.gov.nt.ca/covid-19/en/services/translated-information>).
- **Government of the Northwest Territories launches unified Covid-19 response website.** (2020). <https://www.gov.nt.ca/en/newsroom/government-northwest-territories-launches-unified-covid-19-response-website>

Risk management and mitigation

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- **Regional updates on support for Indigenous Peoples Government of Canada Indigenous Community Support Fund (ICSF)** (2020).
- **CommunityFirst Covid-19 Roadmap** (2020) is a 3-step online planning tool to support Indigenous communities to Organize, Prepare and Respond to Covid-19. (also available in Inuktitut). <https://www.communityfirstcovid19.org/>

- **Letter of advice from a doctor: fellows from Chukotka living in settlements and in reindeer herding camps.** (2020).
- **Alaska Governor declared Covid-19 a Public Health Disaster Emergency on 11 April 2020, activating additional state resources to address the pandemic and creating a unified command structure.** (2020). <https://ready.alaska.gov/Covid19/Documents/GOA/03.11.2020%20GOA%20-%20Governor%20Issues%20Public%20Health%20Disaster%20Emergency%20Declaration%20for%20COVID-19.pdf>
- **Preventive measures in Alaska:** on 10 April 2020, the Governor of Alaska and the DHSS announced additional health guidance designed to combat and mitigate the spread of the virus even though Alaska had not yet reported a single confirmed Covid-19 case (<https://ready.alaska.gov/Covid19/Documents/GOA/03.10.2020%20GOA%20-%20SOA%20Urges%20Alaskans%20to%20follow%20New%20Health%20Guidance.pdf>).
- **Senior Alaskan officials instituted Health Mandates** (required) (<https://covid19.alaska.gov/health-mandates/>) and Alerts (advised) (<https://covid19.alaska.gov/health-alerts/>) **designed to address, manage, and mitigate risks and protect public health.** Examples of some of these mandates include: critical infrastructure operations; education; entertainment and dining; fishing vessels; travel restrictions limiting all non-essential travel -- particularly to rural Alaska and remote communities -- to minimize infections in communities with limited capacity and ability to respond to infections.
- **Covid-19 and fisheries:** Bristol Bay Borough in Alaska established a website and links to response plans developed by the region's largest fish processors to protect its US 1.5 billion salmon fishery industry. (2020). http://www.bristolbayboroughak.us/covid-19_information/index.php
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- **Economic impact of Covid-19 in Alaska:** April 2020 (<https://labor.alaska.gov/trends/apr20.pdf>) and May 2020 (<https://labor.alaska.gov/trends/may20.pdf>) *Alaska Economic Trends* publications.
- **Alaska subsistence and commercial fisheries** designated as "critical infrastructure industries" that enable operation during the 2020 season. <https://gov.alaska.gov/wp-content/uploads/sites/2/Alaska-Essential-Services-and-Critical-Workforce-Infrastructure-Formerly-Attachment-A-05.05.2020.pdf>

Part II: Consequences of Pandemic and Public Health Responses

Impacts on physical well-being and mental health

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- **Covid-19 and gender equality: discussion between the Prime Minister of Iceland and Austrian Minister of Equality.** (2020, 6 May). <https://www.government.is/news/article/2020/05/06/Prime-Minister-of-Iceland-and-Austrian-Minister-of-Equality-discuss-COVID-19-and-gender-equality/>
- **Coronavirus and other health risks among Inuit.** ICC Covid-19 Statement. (2020). <https://www.inuitcircumpolar.com/news/coronavirus-and-other-health-risks-among-inuit/>
- **Arctic Investigations Program (AIP) by the U.S. Centers for Disease Control and Prevention (CDC) that prioritizes monitoring and controlling infectious diseases in Alaska** (with a focus on Alaska Native people and other Indigenous populations across the Arctic. (2020). <https://www.cdc.gov/nceid/dpei/aip/index.html>
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- **Covid-19 tracking site for Alaska.** (2020). <https://coronavirus-response-alaska-dhss.hub.arcgis.com/>
- **Alaska Department of Health and Social Services. Data, Statistics and Publications on MCH Epidemiology, Covid-19 Related Surveys.** (2020). <http://dhss.alaska.gov/dph/wcfh/Pages/mchepi/default.aspx>
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- **National American Indian and Alaskan Mental Health Technology Transfer Center (MHTTC) provides a resource guide for mental health providers during Covid-19.** (2020). <https://mhttcnetwork.org/centers/national-american-indian-and-alaska-native-mhttc/product/resource-guide-mental-health>
- **National Indian Health Board (NIHB) provides a collection of links and information on Covid-19 funding opportunities, including a running tracker of available grants.** (2020). <https://www.nihb.org/covid-19/funding-opportunities/>

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- **Fisherman's Handbook developed for the Bristol Bay Regional Seafood Development Association in Alaska**, which include guidelines for the region's commercial fishing fleet. (2020). <https://static1.squarespace.com/static/56b0dfb660b5e98b87fc3d52/t/5ec3fc4ecc9a666e61c3e363/1589902415381/BB+COVID+Handbook+v4.pdf>
- **Economic impact of Covid-19 in Alaska:** April 2020 (<https://labor.alaska.gov/trends/apr20.pdf>) and May 2020 (<https://labor.alaska.gov/trends/may20.pdf>) *Alaska Economic Trends* publications.
- **Alaska subsistence and commercial fisheries** designated as "critical infrastructure industries" that enable operation during the 2020 season. <https://gov.alaska.gov/wp-content/uploads/sites/2/Alaska-Essential-Services-and-Critical-Workforce-Infrastructure-Formerly-Attachment-A-05.05.2020.pdf>
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- **Impacts on air travel in Alaska:** the case of RavnAir. (2020). <https://www.ktuu.com/content/news/RavnAir-shutdown-expect-to-hit-remote-Alaska-villages-the-hardest--569428341.html> and <https://www.flyravn.com/ravn-news/ravn-seeks-chapter-11-protection/>
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Impacts on vulnerable persons

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- **Mitigation activity:** public funds toward student summer jobs with goal of creating 3 400 temporary jobs for students. (2020). <https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2020/05/13/Taekifaeri-fyrir-namsmenn-adgerdir-stjornvalda-vegna-sumarstarfa-og-sumarnams/>
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- **Alaska Mental Health Trust, Covid-19 Response** Trust Grant Program established for beneficiaries facing complications operating and providing critical services during the Covid-19 pandemic. (2020). <https://alaskamentalhealthtrust.org/alaska-mental-health-trust-authority/grants/covid-19-response-grant-program/>
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Impacts on knowledge production

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- **Norwegian evidence map providing extensive overview of global network of research on Covid-19** (2020). <https://sciencenorway.no/epidemic-virus/norwegian-evidence-map-may-be-one-of-the-worlds-most-systematic-overviews-of-research-on-covid-19/1676520>
- **Nordic Health Data Research Projects on Covid-19.** (2020). <https://en.rannis.is/news/nordic-health-data-research-projects-on-covid-19>
- **Potential Impacts of COVID-19 on the 2020 Activities of the Canadian Northern Contaminants Program and Proposed Management Approach:** Document goes through list of effected research activities due to travel restrictions and affected funding, as well as their impact on students and their employment and graduation requirements – this program is affiliated with the AMAP working group.
- **Universities and educational institutions have as a result of Covid-19 increased heavily digital teaching and developed new learning platforms and techniques.** The Covid-19 crisis may therefore broaden the range of courses offered online to remote communities – thus making education more easily available. See: Business Index North (BIN) report dealing with Sustainability in the Arctic Regions: What, How and Why? released by the *High North Center for Business and Governance*, Nord University. (May 2020). <https://businessindexnorth.com/Home>

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- **In early April, the NSF urged the scientific community to submit proposals to conduct non-medical, non-clinical research on COVID-19.** As of May 20, the NSF had funded over 460 research projects addressing COVID-19 impacts. Recently funded NSF research includes projects evaluating the environmental effects of COVID-19 quarantine orders, including impacts on urban air quality, water quality, particulate emissions, and weather. <https://www.nsf.gov/pubs/2020/nsf20052/nsf20052.jsp>
- **Arctic Observing Summit 2020 (AOS) Conference** Statement and Call to Action. (2020).
- **Covid-19 Impacts in the Arctic.** Canadian International Arctic Centre, Embassy of Canada to Norway. (2020).
- **Information about Covid-19 from the Government of the Yukon in Canada.** (2020). <https://yukon.ca/covid-19>

Mobility

- **Learning traditional Inuit skills while bracing for Covid-19 in Canada's Arctic.** (2020). <https://nunatsiaq.com/stories/article/on-the-land-during-a-pandemic/#.Xqc6xM49Dgl.email>
- **Inuit Circumpolar Council .** Coronavirus and other health risks among Inuit. (2020). <https://www.inuitcircumpolar.com/news/coronavirus-and-other-health-risks-among-inuit/>
- **The COVID-19 pandemic forced the closure of a number of cultural centers** (e.g., art museums, special exhibits), including the Alaska Native Heritage Center. Impacts include lack of revenue for many Alaska Native households and Native corporations. (2020).
See: <https://www.alaskanative.net/alaska-native-heritage-center-covid-19-response/>; <https://www.sealaskaheritage.org/node/1189>; <https://www.uaf.edu/museum/plan-your-visit/hours/index.php>; <https://www.sealaskaheritage.org/institute/celebration/celebration-programs>; <https://www.anchorage.net/blog/covid-19-traveler-information/>; <https://www.explorefairbanks.com/blog/post/covid-19/>.
- **Covid-19 Impacts in the Arctic.** Canadian International Arctic Centre, Embassy of Canada to Norway. (2020).
- **Information about Covid-19 from the Government of the Yukon in Canada.** (2020). <https://yukon.ca/covid-19>
- **Supporting key priorities identified by Northern Premiers.** Government of Canada. (April 2020).
- **Canada-United States border closing or restricted access. Implications for international mobility.** (2020).

Enabling public infrastructure

- **Inuit Circumpolar Council** . Coronavirus and other health risks among Inuit. (2020). <https://www.inuitcircumpolar.com/news/coronavirus-and-other-health-risks-among-inuit/>
- **Summary of actions and activities taken by the Government of Nunavut and other Northern Indigenous Organizations in response to Covid-19.** (2020).
- **New Canadian Federal Covid-19 Response Measures for Arctic and Northern Regions** (Canada). Backgrounder. (April 2020).
- **Economic impact of Covid-19 in Alaska:** April 2020 (<https://labor.alaska.gov/trends/apr20.pdf>) and May 2020 (<https://labor.alaska.gov/trends/may20.pdf>) *Alaska Economic Trends* publications.
- **Alaska subsistence and commercial fisheries designated** as “critical infrastructure industries” that enable operation during the 2020 season. <https://gov.alaska.gov/wp-content/uploads/sites/2/Alaska-Essential-Services-and-Critical-Workforce-Infrastructure-Formerly-Attachment-A-05.05.2020.pdf>
- **Devastation for Alaska’s tourism industry.** (May 2020). <https://www.ktoo.org/2020/05/17/alaskas-quarantine-order-has-helped-thwart-covid-19-but-devastated-tourism-will-dunleavy-keep-it/>
- **Devastation for Alaska’s cruise industry.** (May 2020). <https://www.alaskapublic.org/2020/05/06/carnival-princess-holland-america-cancel-all-2020-alaska-cruises/>
- **Keep Americans Connected Pledge.** U.S. Federal Communications Commission (FCC). <https://www.fcc.gov/keep-americans-connected>
- **Impacts on air travel in Alaska:** the case of RavnAir. (2020). <https://www.ktuu.com/content/news/RavnAir-shutdown-expect-to-hit-remote-Alaska-villages-the-hardest--569428341.html> and <https://www.flyravn.com/ravn-news/ravn-seeks-chapter-11-protection/>
- **Addressing power supply in Alaska during Covid-19.** Input for Alaska power providers. (2020). <https://alaskapower.org/covid-19/>

Appendix 2 – Detailed overview of process to prepare briefing document

Discussions about the potential impacts of the coronavirus pandemic on the Arctic and the priorities and mandate of the Arctic Council arose early. In late April 2020 **the Chair of the Senior Arctic Officials (SAOC) requested that the Sustainable Development Working Group (SDWG) and Arctic Council Secretariat (ACS) prepare a briefing document for SAOs**, collecting available information on the impacts of the coronavirus pandemic in the Arctic from experts, policymakers and Indigenous representatives and knowledge holders connected to the Arctic Council.

A coordinating team was quickly established to support this work, which included the Chairs of the Arctic Human Health Expert Group (AHHEG) and the Social, Economic and Cultural Expert Group (SECEG), the Executive Secretary of the Sustainable Development Working Group (SDWG), and an Advisor and the Head of Communications from the Arctic Council Secretariat. The preparation of this briefing document relied on the existing networks of the Arctic Council's six Working Groups, national delegations and Indigenous Permanent Participants and adopted an open and collaborative approach.

It involved contributions and input from more than **fifty researchers, policy makers, Indigenous representatives and Indigenous knowledge holders from all Arctic States and Permanent Participants**. This group provided source material and helped shape and define the twelve thematic sections that are covered in this briefing document. To facilitate involvement by Indigenous peoples and ensure their perspectives were reflected, Permanent Participants were also given the option to **share their insights and experiences with the pandemic by responding to interview questions** (see appendix 3). In addition, this document is informed by the expertise shared during a virtual conference on *Covid-19 Impacts in the Arctic* organized by the US Naval War College, the Wilson Center's Polar Institute, and the US Arctic Research Commission².

Subsequently, the coordinating team consolidated the information collected in an internal online tracking tool that organized the material into the **twelve thematic sections identified for the briefing document**. At this time, authors were confirmed to draft each section. Drawing on

² The Arctic Mayors' Forum met online 22 April 2020 to discuss the Covid-19 situation in their communities. Data is being collected through a survey inquiring about the status of infections and related issues, as well as socio-economic impacts, an overview of implemented restrictive measures and next steps.

this information collected, the authors were asked to **identify themes and issues for their thematic section** and to **consider potential gaps in knowledge and/or ideas for potential action areas**. A total of 17 authors were involved in preparing this briefing document. Several rounds of feedback and revision were undertaken with the authors before the final version was distributed to the delegates of the June SAOX for their discussion.

Appendix 3 – Consultation with Permanent Participants

Representatives of the Arctic Council's Permanent Participants were invited to share insights to how Indigenous peoples across the Arctic are affected by the pandemic and the measures taken to contain it through a questionnaire for narrative input. Members of all Permanent Participant organizations were contacted and given the opportunity to address the set of questions listed below.

Questionnaire for Permanent Participants

- How are [add Indigenous people's name] communities affected by the coronavirus pandemic? (immediate health effects: how many people have been infected, etc.)
- How are [add Indigenous people's name] informed about the pandemic and measures taken to tackle it?
- Are there health issues and/or other factors that could influence the susceptibility of [add Indigenous people's name]? (infrastructure, inadequate/crowded housing, water/sewer, etc.) What steps have/could be taken to alleviate these problems?
- How are [add Indigenous people's name] communities affected by the national measures taken to contain the coronavirus? (positive and negative impacts, such as uninterrupted calving season, travel restrictions, isolation, disconnections from elders, business closures, closed borders etc.)
- Have [add Indigenous people's name] communities taken any measures in addition to national/regional measures to contain the outbreak?
- Are there examples of community resilience that have helped in this situation?
- Could you describe the health facilities [add Indigenous people's name] communities have access to and how far away they are from communities? (medical care facilities, distance to hospitals, etc.)

Oral interviews were conducted with Jimmy Stotts and Dalee Sambo Dorough from the Inuit Circumpolar Council (ICC). Written contributions were received from the Aleut International Association, the Arctic Athabaskan Council, Gwich'in Council International, ICC Chukotka, the Russian Association of Indigenous Peoples of the North, and the Saami Council. Thus, all six Permanent Participants provided input.

The interviews can be found here: <https://arctic-council.org/en/news/the-impact-of-covid-19-on-indigenous-peoples-in-the-arctic/>